SECTION 00 0101 - PROJECT TITLE PAGE

PROJECT NAME:
St. Theresa Village
6783 Siebern Ave., Cincinnati, Ohio 45236

OWNER:
National Church Residences
2245 North Bank Drive, Columbus, Ohio 43220

ARCHITECT:
Berardi + Partners, LLC
1398 Goodale Blvd., Columbus, Ohio 43212

GENERAL CONTRACTOR:
Model Group
1826 Race St, Cincinnati, OH 45202

STRUCTURAL ENGINEER:
Shirk & O'Donovan Consulting Engineers
370 E. Wilson Bridge Rd., Worthington, Ohio 43085

SYSTEMS ENGINEER:
Berardi + Partners, LLC
1398 Goodale Blvd., Columbus, Ohio 43212

Date of Document December 17, 2025

BERARDI+
ARCHITECTURE | INTERIOR DESIGN | ENGINEERING

STATE OF OHIO
GEORGE D. BERARDI
6480
REGISTERED ARCHITECT

GEORGE D. BERARDI,
LICENSE #6480
EXPIRATION DATE
12/31/2025

SECTION 00 0102 - PROJECT INFORMATION

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

A. Project Name: St. Theresa Village, located at 6783 Siebern Ave., Cincinnati, Ohio 45236.

B. Project Number: 24126.

C. The Owner, hereinafter referred to as Owner: National Church Residences.

1.02 PROJECT DESCRIPTION

A. Summary Project Description: See cover sheet of drawings for project summary.

1.03 **TAXES**

A. The project is subject to all applicable local, state and federal sales taxes.

1.04 OWNER OCCUPANCY

A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.

B. Owner intends to occupy the Project upon Substantial Completion.

C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

D. Schedule the Work to accommodate Owner occupancy.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Provide access to and from site by law and by Owner:

1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
2. Do not obstruct roadways, sidewalks, or other public ways without permit.

B. Existing building spaces may not be used for storage unless permission is granted from the owner in writing.

C. Utility Outages and Shutdown:

1. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
2. Limit shutdown of utility services to 3 hours at a time, arranged at least 48 hours in advance with Owner.
3. Prevent accidental disruption of utility services to other facilities.

1.06 PROCUREMENT TIMETABLE

A. The Owner reserves the right to change the schedule or terminate the entire procurement process at any time.

1.07 Performance required during bidding.

A. By submitting a bid for any Section of the work for this project, each sub-contractor must have actually read all of Divisions 00 & 01 prior to reading the technical specifications covering their specific work and reviewing the drawings.

B. Notify in a timely manner to the Architect/Engineer any discrepancies or inconsistencies in the construction drawings and specifications which will impair or prevent achieving the final design requirements of the Project.

C. Submit any product of equal to or greater performance for prior approval. Review 'Submittal Requirements' identified by this project manual.

1.08 Performance required during construction.

A. Reread all of Division 00 & 01 and review the drawings prior to submittal of shop drawings and initiating any related construction.

B. Submit shop drawings, product data and other information required to accurately portray the performance of the product in accordance with the Contract Documents.

C. Manufacturer's Installation Requirements (Manuals) are referenced as part of project requirements in order to ensure the accurate installation and safe/efficient operation of their products.

D. Notify Prime Contractor if any work prior to the installation of your work is not at a quality standard to receive your Work.

E. Follow the directions of the Prime Contractor.

F. Complete the Work in a prescribed manner and time frame to achieve the desired results required by the Contract Documents.

1.09 Job Site Safety.

A. Notify the Prime Contractor of any unsafe conditions.

B. Follow the manufacturer's operations manual for any operation of equipment and required rough-in services for installation of product. Rough-ins services which may not be shown by the drawings will be required to be provided as part of the Contract.

C. Do not drink or consume any matter labeled unsafe or mind altering, while completing the prescribed work for project within your required category of the work.

1.10 Reference Standards.

A. All common standards, laws and protocols which represent quality and are within the boundaries of the common understanding within the industry shall be applied to the project. If you don't know what the limits of your work scope are ask before preparing a bid.

1.11 DOCUMENTATION REQUIRED PRIOR TO CONSTRUCTION START

A. The following must be documented by the Prime Contractor to the Architect that prior to proceeding with the Work they have contracted with sub-contractors and suppliers that they possess the ability to:

1. Read, comprehend and speak the English language
2. Understand that their contractual obligation to perform the Work is governed by both the Project Manual (Specifications) and Drawings, together with all referenced instructions and those standards and codes common to the Construction Industry or specific trade;

1.12 PROCUREMENT DOCUMENTS

A. Availability of Documents: Complete sets of procurement documents may be obtained:

1. Documents may be downloaded from the Architect's File Transmission Protocol (FTP) site or Cloud. Contact the Architect for specific requirements for access.
2. From Owner at the Project Manager's address listed above.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED
END OF SECTION

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SECTION 00 2000 - INSTRUCTIONS TO BIDDERS

PART 1

1.01 Bidding Documents

A. The bidding documents are comprised of the bidding and contract requirements, the specifications, the drawings and any addenda issued prior to receipt of bids.

B. Documents are on file and may be examined or obtained for bidding purposes as stated in Article 8 below.

C. Bidding Documents are prepared for the use of bidders which include the General Contractor, all sub-contractors, material suppliers and all other entities who furnish or manage any portion of the work required to complete the required scope for the project.

1.02 Addenda During Bidding

A. Any additional information required by the bidders, revisions in the work, changes or additions, discrepancies in the bidding documents, or clarifications will be in the form of addenda written and issued by the Architect to the General Contractor as of the date of such addenda.

B. All addenda issued prior to the time and date set for termination of bidding shall become a part of the bidding documents and bidders shall list by number and date on the form of proposal, all addenda which have been received by him prior to submittal of his bid. The lump sum proposal amount shall include all work described by all such addenda. It shall be the bidder's responsibility to determine that he has received all addenda, since no extra costs will be allowed by failure of the bidder to do so.

C. Any bidder in doubt as to the true meaning of any part of the bidding documents. may submit, no later than ten (10) working days prior to the date set for receipt of bids, a written request to the Architect for an interpretation thereof. All interpretations of the bidding documents will be made by an addendum.

D. No oral, telephonic, telegraphic or fax instructions or information shall be binding on the Owner, Architect, or bidder unless confirmed by an addendum.

1.03 Substitutions and Approvals During Bidding

A. Whenever products or materials are specified as "Standards" or they are otherwise named approval of other equal quality products shall be obtained by requesting in writing and presenting for evaluation, such product or material, to the Architect, no later than ten (10) working days prior to date set for receipt of bids. Submittals a circumventing the above time frame will not be processed.

1. If approval is granted, product or material will be added by addendum.
2. No direct reply will be made to any requests for changes, but any requested changes approved by the Architect will be stated in an addendum issued to all prime bidders.
3. Issuance of bidding documents does not constitute approval of products, materials, or subcontractors.

B. Related requirements described elsewhere.

1. Section 016300 SUBSTITUTIONS AND PRODUCT OPTIONS.

1.04 Alternates and Unit Prices

A. Each bidder, in addition to the submission of his lump sum base bid, shall submit bids for any alternate bid and unit price called for; failure to submit said bids and unit prices shall be sufficient cause for the Owner to reject the bid in its entirety. Also, the Owner may, at his discretion, consider any required alternate bid in the awarding of a contract.

1. Unit prices shall be the installed price unless otherwise called for and shall include overhead, profit, fees and such other costs incidental to the work described.
2. Unit prices shall be used to replace products, materials, etc. which cannot be repaired or reused as indicated on the Drawings and Specifications. Unit prices shall also be used to repair or replace products, materials, etc. which have been found unacceptable during field surveys and inspections after the contract has been awarded, but prior to performing the additional work. Unit prices shall be used for all revisions involving the addition or deletion of Contract Work.

B. The price to be added and/or deducted shall include all labor, materials, equipment, services, facilities and all other items required to complete the work as indicated on the drawings and as specified herein. Each bidder is encouraged to submit voluntary alternates for materials, procedures and equipment that benefit the project and produce a savings to the Owner.

C. The Owner retains the right to include or exclude work covered by unit prices, for the sums established exercisable for the life of the contract.

D. All bidders shall thoroughly review and indicate for each alternate the appropriate add or deduct, no change (N/C) or not applicable (NIA). No indication will be considered as a no change. The Bidder shall be responsible for all costs associated with the Alternate as respects his contracted work regardless of the notation entered on the bid form.

E. Time extension alternates will have a direct effect upon schedule therefore labor and material increases should be contemplated in the extension alternates not only for the actual time extension but also for the impact on the overall schedule based upon the time of year the project is started.

1.05 Bidder's Representation

A. Each bidder, by making his bid, represents that he has read and understands the bidding documents.

B. Each bidder shall make a careful examination of the plans and specifications, visit the site of the proposed construction and acquaint himself with all the conditions before submitting his proposal. He will be held responsible for any and all errors in his proposal resulting from his failure to make such examination. No "Request for Extras" will be entertained as a result of the bidder failing to examine the plans and specifications and inspecting the site(s) or those existing buildings when existing buildings which may be retained as part of the project. *Any discrepancies between actual field conditions and work specified in contract documents shall be brought to the written attention of the Architect during bidding or prior to bidding during initial project qualifications for bidding.*

C. Each bidder by making his bid represents that he is properly licensed and has previous experience of the nature of the work he is bidding.
D. Each bidder by preparing and submitting a bid represents that they have reviewed and understand all manufacturer's requirements for the complete installation of manufactured items.
1. Manufacturer's instruction may include exact utility and service connections for specified systems, which systems may not be defined, detailed, or located by the project drawings or specifications.

1.06 Preparation of Bids
A. Proposals should be submitted on company letterhead.
B. Bids shall include all required documents, as noted within this Project Manual, with signatures in ink.
1. Prices shall be stated both in figures and in writing and in the event of a discrepancy between the writing and the figures, the written amount shall govern.
C. Any interlineation, alteration, or erasure will be grounds for rejection of the bid. Bids shall contain no recapitulation of the work to be done.
D. Bids shall be based on the materials, construction, equipment and methods named or described in the specifications and on the drawings, and any addenda issued prior to receipt of bids.
E. The General Contractor and each bidder to the General Contractor for the complete construction of the project must, within 7 days of receipt of request by Owner, must submit on a sheet of their company letterhead, a listing of major subcontractors, suppliers, and manufacturers furnishing and/or installing materials and products (including those who are to furnish materials or equipment fabricated to a special design) specified on this project. The list shall be complete with names, addresses, city, state and zip code.
F. The low bidders shall be required to attend with the General Contractor and representatives of the Owner and Architect, a Pre-Award Conference. It should be noted that attendance is mandatory and the information received/confirmed at the conference will be considered in awarding a Contract.
G. Proposal Irregularities: Any error and/or omission in the proposal form or any other irregularity as a result of negligent preparation shall not furnish cause for relief for any damages resulting therefrom nor in any way relieve the Contractor from fulfillment of all contractual obligations as provided for in the Contract Documents.

1.07 CONTRACT TIME
A. Identify Contract Time in the Proposal Form. The completion date in the Agreement shall be the Contract Time added to the commencement date.

1.08 Plans and Specifications on File
A. Plans and specifications are on file in the Offices of the Architect and available upon request.

1.09 INTENT
A. The intent of this Proposal request is to obtain an offer to perform work to complete the project as herein described for a Stipulated Sum contract, in accordance with the Contract Documents.

1.10 INQUIRIES/ADDENDA
A. Direct questions to the Architect's office via email to the designated project manager.
B. Addenda may be issued during the Proposal period. All Addenda become part of the Contract Documents. Include resultant costs in the Proposal Amount.
C. Verbal answers are not binding on any party.

1.11 SITE EXAMINATION
A. Examine the project site before submitting a Proposal.

1.12 **PREPROPOSAL CONFERENCE**
A. A proposers conference shall be scheduled and proposers notified.
B. All general contract proposers and suppliers are invited.
C. Representatives of Architect will be in attendance.
D. Information relevant to the Proposal Documents will be recorded in an Addendum, issued to Bid Document recipients.

1.13 EVIDENCE OF QUALIFICATIONS
A. To demonstrate qualification for performing the Work of this Contract, proposers may be requested to submit written evidence of financial position, license to perform work in the State and City.

1.14 SUBMISSION PROCEDURE

1.15 **SALES TAX**
A. This project is subject to all applicable sales taxes.

1.16 Nondiscrimination: Affirmative Action
A. The Bidder agrees that in the performance of this Agreement it shall not discriminate against any applicant for employment nor any sub-contractor or material supplier because of race, religion, sex, color, national origin, handicap, or age. The Bidder will take affirmative action to insure that applicants are employed, and that employees are treated during employment, without regard to race, religion, color, sex, national origin, handicap, or age. The Bidder shall require all contracts with its Subcontractors to contain this same provision. The Bidder and all Subcontractors shall comply with all employment and equal opportunity requirements of local, state, and federal law and regulations.

END OF SECTION

SECTION 00 3100 - AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

1.01 EXISTING CONDITIONS

A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders and will be part of the Contract Documents, as follows:

B. Site Survey and Utility Existing Drawings: Available from architect, to provide location and sizes for all utlities of public record, location of and existing improvements, and detailed topographic information.

1.02 SUSTAINABILITY DESIGN REQUIREMENTS AND CERTIFICATION INFORMATION

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

3.01 OBTAINMENT OF PERMITS

A. The following permits are known to be required and shall be obtained by the Contractor:

1. Full / Blanket Building Permit including all trade / subcontractor permits..

END OF SECTION

SECTION 00 5000 - CONTRACTING FORMS AND SUPPLEMENTS

PART 1 GENERAL

1.01 AGREEMENT AND CONDITIONS OF THE CONTRACT

A. See Section 00 5200 - Agreement Form for the Agreement form to be executed.
B. See Section 00 7200 - General Conditions for the General Conditions.
C. See Section 00 8000 for the Supplementary Conditions.
D. The Agreement is based on AIA A101, 2017
E. The General Conditions are based on AIA A201, 2017.

1.02 FORMS

A. Use the following forms for the specified purposes unless otherwise indicated elsewhere in Contract Documents.
B. Bond Forms:
   1. Bid Bond Form: AIA A310.
   2. Performance and Payment Bond Form: AIA A312.
C. Clarification and Modification Forms:
   1. Architect's Supplemental Instructions Form: AIA G710.
   2. Construction Change Directive Form: AIA G714.
   3. Change Order Form: AIA G701.
D. Closeout Forms:
   1. Certificate of Substantial Completion Form: AIA G704.
   2. Affidavit of Payment of Debts and Claims Form: AIA G706.
   3. Contractor’s Affidavit of Release of Liens Form: AIA G706A
   4. Separate Release or Waivers of Liens from Subcontractors and material and equipment suppliers, accompanied by a list thereof.

1.03 REFERENCE STANDARDS

A. AIA A101 - Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum; 2017.
B. AIA A201 - General Conditions of the Contract for Construction; 2017.
C. AIA A310 - Bid Bond; 2010.
D. AIA A312 - Performance Bond and Payment Bond; 2010.
E. AIA G701 - Change Order; 2017.
F. AIA G704 - Certificate of Substantial Completion; 2017.
G. AIA G706A - Contractor’s Affidavit of Release of Liens; 1994.
H. AIA G710 - Architect's Supplemental Instructions; 2017.
I. AIA G714 - Construction Change Directive; 2017.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 00 5200 - AGREEMENT FORM

PART 1 GENERAL

1.01 **FORM OF AGREEMENT**

A. The Bidder to whom an award of the Contract is made shall execute an agreement directly with the Owner using AIA Document A101, Standard Form of Agreement between Owner and Contractor, 1987 Edition, as published by the American Institute of Architects, where the basis of payment is a stipulated sum.

B. The bidder to whom an award of the contract is made shall execute an agreement directly with the onwer using AIA Document A102, Owner Contractor Agreement as published by the American Institute of Architects, where the basis of payment is Cost Plus Fee with GMP.

C. Copy of the Contract Form is on file in the Architect's office and available upon request through the Architect, if not otherwise bound immediately following this page of the Project Manual.

1.02 RELATED REQUIREMENTS

A. Section 00 7200 - General Conditions.

B. Section 00 8000 - Supplementary Conditions.

C. Section 01 4216 - Definitions.

D. Documents used for project processing shall be American Institute of Architects Documents, latest editions, and referenced by the following document numbers.

E. When alternate Owner/Contractor Agreement forms are adopted for the project by the Owner, othr than Standard American Institute of Architect Document forms, the Owner shall include AIA Document A201-2007 General Conditions to the Contract for Construction, and other applicable Supplementary Conditions.

1.03 **FORMS**

A. Use the following forms for the specified purpose unless otherwise indicated elseehwere in the Contract Documents.

B. Clarification and Modification Forms

1. Supplementary Instruction Form: AIA G710
2. Construction Change Difrective Form: AIA G714
3. Contract Chnage Order Form: AIA G701

C. Closeout Forms:

1. Certificate of Substantial Completion Form: AIA G704

D. Certificates of Payments

1. Application and Certificate for Payment Form: AIA G702
2. Continuation Sheet for AIA G702: AIA G703

1.04 REFERENCE STANDARDS

A. AIA G704 - Certificate of Substantial Completion; 2000

B. AIA G710 - Architect's Supplemental Instructions; 1992

C. AIA G704 - Construction Change Directive; 2007

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 00 7000 - GENERAL CONDITIONS

PART 1

1.01 The General Conditions of the Contract for Construction, AIA A201 (2007) are hereby made a part of the Contract Documents, except as they may be modified by Section 00800 SUPPLEMENTARY CONDITIONS and the specific provisions of these documents.

1.02 Refer to: AIA A201 (2007) pages 1 thru 43.

END OF SECTION

SECTION 00 7100 - CONTRACTING DEFINITIONS

PART 1 GENERAL

1.01 **APPLICABILITY:**

A. These definitions are integral to the Agreemenet, for the portions of the work which are managed throughout the process of construction, or in the case of 'design assist' by the Contractor Contractor in conjunction with the Owner, the Architect and Project Engineers.

1.02 DEFINITIONS - DESIGN-BUILD DOCUMENTS

A. Contract Documents: As defined in the Conditions of the Contract and as follows:
   1. At the time of execution of the Agreement, Contract Documents consist of the following:
      a. The Agreement and Conditions of the Contract, and other documents listed on the Table of Contents under the heading Contracting Requirements.
      b. The Proposal and Proposal Exhibits, except for provisions that contradict the requirements of the Conceptual Documents and that are not specifically accepted by the Owner by means of written Modification prior to execution of the Agreement.
   2. From time to time after execution of the Agreement, upon approval by the Owner, the following types of documents will be incorporated into Contract Documents:
      a. Drawings and other documents documenting the design.
      b. Construction drawings and specifications detailing the execution of the design. All drawings, plans, specifications, other instructions including manufacturer's requirements for installation and any other documents which provides direction for completing the work schedules for the completion of the project.

B. Project Program: The Owner's requirements for size, arrangement, organization, and location of functional spaces , description of space functions , identification of fittings, equipment, and furnishings , description of the physical and environmental requirements for each space , together with a description of the image, goals, or "mission" of the project.

C. Proposal: The Proposal Form and Exhibits, which comprise the information prepared by the prospective Design-Builder to show their method of complying with the Conceptual Documents.

1.03 DEFINITIONS - TIME PERIODS AND MILESTONE DATES

A. Proposal Period: The time period during which prospective Proposers prepare their Proposals.
   1. Substantiation specified to occur during the Proposal period are intended to accompany the Proposal.

B. Preliminary Design: The time period during which the design criteria are finalized and preliminary drawings and written descriptions are prepared to illustrate the proposed design of the work or a portion of the work to the Owner, as described in the Conditions of the Contract.

C. Design Development: The time period during which the form, arrangement, size, and materials of the work or a portion of the work are determinedas described in the Conditions of the Contract..

D. Construction Documents: The time period during which process working drawings, specifications, and other documents describing the work or a portion of the work are prepared in sufficient detail to allow accurate and complete construction.

E. Construction: The time period from the beginning of work on the project site until final payment as defiend in the Conditions of the Contract..

F. Substantial Completion: The date as defined in the Conditions of the Contract. Date of Substantial Completion is the due date for the following:
   1. Design-Builder or Architect's complete punchlist of items to be completed.
   2. Owner's complete punchlist of items to be completed.
   3. Compliance with requirements of governing authorities, for submittals, inspections, and permits.
   4. Compliance with Owner's requirements for access to areas occupied by the Owner.
   5. Final cleaning.
   6. Maintenance manuals.
   7. Warranties.
   8. Spare parts and extra materials.
   9. Maintenance supplies and tools.
   10. Project record documents.
   11. Final site survey.

G. Closeout: The time period during which all details of both construction and commissioning are completed.
   1. The Closeout period is the time from Date of Substantial Completion until final payment, both as defined by the Conditions of the Contract.
   2. Before and during the Closeout period, the Owner will ascertain whether the completed project complies with Contract Documents.
   3. Contractor is responsible for operation and maintenance of the project until the end of the Closeout period; except for those areas the owner has moved into. Once the owner has moved into an area the contractor's responsibilities for operation and maintenance of that area will decease.
   4. Training of Owner's personnel in operation and maintenance occurs during the Closeout period, unless specifically indicated otherwise for certain items.

H. Occupancy: The time period during which the project is occupied for its intended purpose.
   1. The Occupancy period begins at Date of Substantial Completion, as defined by the Conditions of the Contract.
   2. Move-in will occur before the end of the Closeout period.
   3. Design-Builder is responsible for operation and maintenance of the project until the end of the Closeout period.

I. Correction Period: The time period defined by the Conditions of the Contract.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED
END OF SECTION

SECTION 00 8000 - SUPPLEMENTARY CONDITIONS

PART 1

1.01 Scope

A. Description

1. The following supplements modify, change, delete from or add to the "General Conditions of the Contract for Construction," AIA Document A201, 2007 edition. Where any article of the General Conditions is modified or any paragraph, subparagraph or clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that article, paragraph, subparagraph or clause shall remain in effect.

PART 2

2.01 Supplements

A. Article 1 - General Provisions

1. Add the following clause to subparagraph 1.2.3:
   a. 1.2.3.1 The specifications are, in part, of the brief or "streamlined" type and include incomplete sentences. Omissions of words or phrases such as "The Contractor shall", "as noted on the drawings", "according to the drawings", "a", "an", "the" and "all" are intentional.
      1) Omitted words or phrases shall be supplied by inference in same manner as they are when "note" occurs on the drawings. Words "shall" or "shall be" shall be supplied by inference where a colon(:) is used within sentence or phrases. Words "as per" shall mean "in accordance with". Words "provide" and "work" shall mean furnish, install and connect up complete, in operative conditions and use, all materials, equipment, apparatus and required appurtenances of the particular item to which it has reference. Whenever words "approved" "satisfactory", "directed", "submitted", "inspected", or similar words or phrases are used, it shall be assumed that the word "Architect" follows the verb as the object of the clause, such as "approved by the Architect" and "submitted to the Architect". Where a manufacturer's name is mentioned, words "as manufactured by" or "as made by" shall be understood.
2. Add the following clause to subparagraph 1.6.1:
   a. Reproduction of any portion of the Architect’s Construction Documents for use as Submittals for Shop Drawings is not acceptable.

B. Article 3 – Contractor

1. Add the following clause to subparagraph 3.3.1:
   a. 3.3.1.1 The Contractor shall review any specified construction or installation procedure, including those recommended by Manufacturers and shall advise the Architect:
      1) the specified procedure deviates from good construction practice
      2) following the procedure, will affect any warranties, including the Contractor’s general warranty.
      3) any objections that the Contractor may have to the procedure
      4) the Contractor proposes any alternative procedure which the Contractor is willing to warrant.
2. Add the following subparagraphs to paragraph 3.4:
   a. 3.4.3 Products are generally specified by ASTM or other referenced standard, and/or by manufacturer's name and model number or trade name. When specified only by reference standard, the Contractor may select any product or manufacturer as specified as being equally acceptable. The Contractor has the option of using any product and manufacturer combination listed. (When only one product and manufacturer is specified, this is the basis of the Contract, without substitution or exception).
3. Add the following clause to subparagraph 3.4.5:
   a. 3.4.5.1 The Contractor shall disclose the existence and extent of any financial interest, whether direct or indirect, he has in Subcontractors or Material Suppliers which he may propose for this project.
4. 3.4.6 Substitutions will not be considered if:
   a. they are indicated or implied on shop drawings submissions without the formal request required in subparagraph 3.4.4.
   b. for their implementation they require a substantial revision of the Contract Documents in order to accommodate their use.
   c. They appear to be merely for the decrease in expenditures on behalf of the Contractor without a corresponding reduction in costs to the Owner.
5. 3.4.7 All Contractors and subcontractors employed on the work shall be required to conform to the governing labor laws and the various acts amendatory thereto, and all other laws, ordinances and legal requirements applicable thereto.
6. 3.4.8 The Contractor or his subcontractors shall not discriminate in hiring or any matter of employment by reason of sex, race, color, religion, ancestry, or national origin. Submission of a bid on this project is implied acceptance of the inclusion of this clause and all Contract Documents.
7. Add the following clauses to subparagraph 3.18.1:
   a. 3.18.1.1 The Contractor is solely responsible for all citations and penalties arising out of, or resulting from, the performance of the work under his Contract.
   b. The Contractor shall indemnify and hold harmless the Owner, the Architect, and their agents and employees from and against all claims, damages, losses and expenses, including attorney's fees, arising out of such Occupational Safety and Health Act violations and other applicable ordinances, rules, and regulations outlined in Article 10.

C. Article 4 - Administration of the Contract

1. Arbitration: Delete all references to arbitration from the General Conditions.
2. Add the following clause to subparagraph 4.2.4:

a. 4.2.4.1 Any direct communication between the Owner and Contractor that affects the performance or administration of the Contract shall be made or confirmed in writing, with copies to the Architect, and any such communications that represent a modification of the Contract requirements shall be documented appropriately.

3. 4.2.4.2 Any communications among the Architect and Subcontractors shall be confirmed in writing to the Contractor.

D. Article 5 – Subcontractors

1. "5.2.1 (Delete the first sentence of this paragraph and substitute the following.) Each bidder, within 20 calendar days after award of the Contract, shall submit on a sheet of their Company Letterhead, for review by the Owner and Architect, a complete list of major subcontractors and manufacturers furnishing and/or installing materials and products specified on this project. The list shall be complete with names, addresses, city, state and zip code."

E. Article 7 - Changes in the Work

1. In the first sentence of subparagraph 7.3.6, delete the words "a reasonable allowance for overhead, and profit" and substitute "an allowance for profit in accordance with the schedule set forth in subparagraphs 7.3.10".
2. Add the following subparagraph to paragraph 7.3:
   a. 7.3.10 In subparagraphs 7.3.3 and 7.3.6 the allowance for profit included in the total cost to the Owner, shall be based on the following schedule:
      1) For the Contractor, for work performed by the Contractor's own forces, the percentage equal to the current percentage for the Contractor=s overhead and profit.
      2) For the Contractor, for work performed by his subcontractor, five percent (5%) of the amount due the subcontractor.
      3) For the Contractor, for materials supplied by his material supplier, five percent (5%) of the amount due the material supplier.
      4) Cost to which profit is to be applied shall be determined in accordance with subparagraphs 7.3.6 and 7.3.7.
      5) In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Separate labor breakdowns shall be submitted for foremen, mechanics, apprentices and laborers. Where major cost items are subcontracts, they shall be itemized also. In no case will a change involving over $500.00 be approved without such itemization
      6) For deduct Change Orders not signed by the Contractor, the Architect will hold funds equal to the deduct until signed.

F. Article 8 – Time

1. Revise subparagraph 8.1.2 to read as follows:
   a. "The date of commencement of the work is the date established in a notice to proceed. If there is no notice to proceed, it shall be the date established in the Agreement. The date shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible."
2. Add the following subparagraphs to paragraph 8.2:
   a. 8.2.4 Each prime Contractor, subcontractor, and/or material company shall furnish sufficient labor forces, construction plant and equipment, temporary heat, enclosures, etc., required for their work and protection unless specified elsewhere, and shall work such hours, including night shifts and overtime operations as may be necessary to insure the prosecution of the work in accordance with the approved current progress schedule. If, in the opinion of the Architect, the Contractor falls behind the progress schedule, the Contractor shall take such steps as may be necessary to improve his progress without additional cost to the Owner. Failure of the Contractor to comply with the requirements of the Architect under this provision .shall be grounds for determination by the Architect that the Contractor is not prosecuting the work with such diligence as will insure completion within the time specified. Upon such determination, the Owner shall have the right, without limiting any other right he may have to either not approve reduction of retainage or to terminate the Contractor's right to proceed with the work or any separable part thereof.
   b. 8.2.5 Timely performance is an expressed condition of the contract and any delay in the Contractor's performance may excuse the Owner from his obligation to perform. Failure to abide by the time condition may be treated as a breach of contract.
3. Delete subparagraph 8.3.2 and replace with the following:
   a. 8.3.2 The Contractor agrees that whether or not any delay shall be the basis for a modification of time, he shall have no claim against the Owner or Architect for an increase in the contract price, nor a claim against the Owner or Architect for a payment or allowance of any kind for damage, loss or expense resulting from delays, or acceleration, or any other modification of schedule; nor shall the Contractor have any claim for damage, loss or expense resulting from interruptions to or suspension of, his work to enable other Contractors to perform their work. The only remedy available to the Contractor shall be a modification of time.

G. Article 9 - Payments and Completion

1. Revise clause 9.3.1.1 to read as follows:
   a. "Such applications may not include requests for payment on account of changes ...".
2. Add the following to clause 9.3.1.1:
   a. Such applications shall not include Change Orders that have been issued but have not been fully executed.

3. Add the following subparagraphs to paragraph 9.8.2:
   a. 9.8.2.1 If the initial inspection requested by the Contractor to establish Substantial Completion determines the Project is not substantially complete, the Contractor shall pay for additional re-inspections by the Architect, at no expense to the Owner.
4. In subparagraph 9.8.3, add the following:
   a. "The payment shall be sufficient to increase the total payments to ninety-five percent (95%) of the contract sum, less such amounts as the Architect shall determine for all incomplete work and unsettled claims."

H. Article 10 - Protection of Persons and Property
1. Add the following clauses to subparagraph 10.1.1:
   a. 10.1.1.1 If the Owner believes in good faith that the Contractor is not fulfilling his responsibilities under Article 10 of the General Conditions, the owner may, but is not required, to order the Contractor to immediately cease work until such time as the Contractor comes within compliance. If the Owner believes in good faith that the Contractor has failed to come within compliance within seven (7) days of receiving the notice to cease work, the Owner may terminate the Contract obligations under Article 14 of the General Conditions. Nothing contained herein shall be deemed to shift the responsibility of the safety of persons and property from the Contractor to any other person or entity, and the Owner and the Architect specifically disavow same.
   b. 10.1.1.2 The Contractor shall indemnify and hold harmless the Owner and Architect for any claim or demand made against either or both which arises out of an actual or claimed violation of Article 10, including all reasonable attorneys' fees and costs of litigation.
   c. 10.1.1.3 The Owner reserves the right to hire an independent third party safety consultant to review and advise on all related safety activities pursuant to the job. This does not relieve in any manner any contractor the specific duty for compliance in regard to any local, state, or federal regulation pertaining to safety on the job-site. Any fines generated as a result of a contractor's non-compliance with a local, state or federal safety regulation shall be the responsibility of the contractor. Any fine issued to the owner (or any party other than the responsible contractor) as a result of a contractor's non-compliance shall be the responsibility of the contractor.
2. Add the following clauses to subparagraph 10.2.1:
   a. 10.2.1.4 All work, materials, apparatus and fixtures, which may be caused by weather (rain, winds, storms, frost and heat).
   b. 10.2.1.5 Excavated banks, trenches and the building from damage from rainwater, spring water, groundwater, backing up of drains or sewers and all other water admitted to the work by his operation. He shall provide all pumps and other equipment and enclosures to provide this protection.
3. Revise Subparagraph 10.2.5 as follows:
   a. The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Clauses 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Clauses 10.2.1.2, 10.2.1.3 and 10.2.1.4. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Paragraph 3.18.

I. Article 11 - Insurance and Bonds
1. Prior to the commencement of any work and prior to the performance of any service, the Contractor shall procure and pay for the following insurance coverages, and he shall maintain them in force after his work is completed and accepted for final payment and throughout the one (1) year guarantee period. The insurers and policies shall be subject to the Owner's approval.
2. The types and amounts of insurance to be provided for by the Contractor shall be as follows:
   a. Workmen's Compensation
      1) Statutory Workmen's Compensation and Occupational Disease Insurance with all elective employments covered and all excluded employments covered on a voluntary basis where permissible,
      2) The Workmen's Compensation policy shall contain the following endorsement, unless specifically prohibited by compensation insurance authorities having jurisdiction:
         (a) "Whereas, Contractor may undertake to perform work for the Owner; and, whereas, said Owner may exercise some degree of jurisdiction or control over the employees of Contractor engaged in such work, it is agreed that, subject to the conditions and limitations of this policy, said Owner is named as an additional insured employer under this policy, but only as respects employees of Contractor whose names appear on the payroll records of Contractor while performing such work for said company."
   b. Bodily Injury and Property Damage Liability
      1) The liability policy shall be on a comprehensive liability form and shall include, but not be limited to, coverage for all operations of the Contractor, including automobile, premises, contractual liability, completed operations liability, personal injury liability and coverage as respects the explosion, collapse and underground hazards.
      2) The Contractor shall effect and maintain insurance covering himself or his agents, the Owner or its assignee and the Architect/Engineer against all claims, demands or actions arising under the Indiana Workmen's Compensation Law against all other claims, demands or actions for injury to, or death of, persons and damage to property, and will furnish the Owner with certificates showing the following coverages in complete satisfaction to the Owner.

3) Worker's Compensation Insurance, Occupational Disease Insurance and Employer's Liability Insurance for all employees engaged in the work under this agreement.
   (a) Employer's Liability $500,000 each Accident, Disease Aggregate
4) Commercial General Liability Insurance, including Contractor's Protective Liability, Completed Operations, Blanket Contractual and Personal Injury Liability, and Coverage as Respects the Explosion, Collapse, and Underground Hazards:
   (a) Each Occurrence $1,000,000
   (b) Personal Injury $1,000,000
   (c) General Aggregate $2,000,000
   (d) Products/Completed Operations
   (e) Aggregate $2,000,000
   (f) Automobile Liability $1,000,000 Occurrence
   (g) Excess Liability $5,000,000 Each occurrence
   (h) $5,000,000 Aggregate
   (i) The combination of Primary and Excess Limits shall meet and/or exceed the above required limits. The insurance coverage provided should meet the exposures relating to the type of work performed.

c. Automobile Insurance: Contractors shall maintain a comprehensive automobile form of insurance with minimum limits of $1,000,000 combined single limit applying to bodily injury and property damage liability. The automobile insurance must include coverage for all owned, nonowned and hired automobiles.

d. Umbrella Liability Insurance: An umbrella policy shall be furnished in the minimum amount of $5,000,000. The above underlying primary limits of liability for both comprehensive general liability and comprehensive automobile liability may be reduced only if an excess umbrella policy is obtained with a minimum limit of $5,000,000 and then only to the extent to the minimum required for primary coverage under such excess contract.

e. Aircraft Liability Insurance: If any aircraft is to be used by the Contractor in connection with this contract either as a conveyance to and from the location of the job site or for use in the course of construction, liability insurance in the amounts acceptable to the Owner shall be obtained by the Contractor and this liability coverage shall be shown on the insurance certificate. If the Contractor will not be using aircraft as described above, then the Contractor shall have the following statement on his certificate of insurance:
   1) "No aircraft is intended for use and said insurance for same is not required."

f. Proof of Carriage of Insurance: The Contractor shall not commence work under this contract until he has obtained all insurance required, as specified herein, and has filed with the Architect three (3) certificates of insurance described herein, evidencing the carriage of insurance and the requisite amounts placed with satisfactory carriers licensed in the State of Insert State here, and countersigned by a resident Insert State here agent. Should any coverage approach expiration during the contract period, it shall be renewed prior to its expiration and certificates again filed with the Architect. Said certificates are to contain the following:
   1) "It is hereby agreed that the Owner shall be notified ten (10) days prior to cancellation of any insurance, material alteration and/or election not to renew."
   2) All insurance shall be maintained in full force and effect until the contract has been fully and completely performed.

g. Owner's Insurance
   1) Owner's Liability Insurance: The Owner shall be responsible for and at their option may maintain such insurance that will protect them from their contingent liability to others for damages because of bodily injury, including theft, and property damages which may arise from operations under any contracts that may be awarded as specified herein.
   2) Property/Builder's Risk Insurance: The Owner shall maintain "All Risk" (Builder's Risk Completed Value Form Insurance) insurance which shall include, but not be limited to, fire, lightning, extended coverage perils, vandalism and malicious mischief, collapse, water damage from bursting pipes, and theft of building materials from the job site upon the renovation/remodeling which is the subject of this contract. Coverage shall include items of labor and materials connected therewith whether in or within 100 feet of the structure insured, materials in place or to be used as part of the permanent construction, including surplus materials, protective fences, bridges, or temporary structures, miscellaneous materials and supplies incidental to the work, and such scaffolding, staging, towers, forms, and equipment as are not owned or rented by the Contractor, the cost of which is included in the cost of the work. The policy shall insure the Owner and shall also include the interest of the Contractor during course of construction until completed and accepted by the Owner. Coverage shall not be voided by partial occupancy until the work is completed and accepted by the Owner.
   3) Loss, if any, is to be adjusted both with and payable to the Owner as trustees for the insureds as their interest may appear, except in such cases as may require payment of all or a portion of such insurance to be made to the mortgagee, as his interest may appear. Any deductibles shall be paid by the Owner.
   4) Exclusions: The insurance does not cover any tools owned by mechanics, any tools, equipment, scaffolding, staging, towers, and forms owned or rented by the Contractor, the capital value of which is not included in the cost of the work, or Contractor's sheds or other structures that are erected for housing the workmen.

J. Article 13 - Miscellaneous Provisions
   1. Delete subparagraph 13.5.5 and substitute the following:
      a. "All equipment shall be inspected and tested under operating conditions. The Architect and/or Owner reserve the right to be present at said testing. Contractor shall give the Architect and Owner at least thirty-six (36) hours advance notice by facsimile prior to scheduling said tests and operations. If inspection or tests show defects, they shall be corrected and inspections and tests repeated until proven satisfactory. Neither the observations of the Architect in administration of the Contract, nor inspections, tests or approvals by persons other than the Contractor, shall relieve the Contractor from obligations to perform the Work in accordance with the Contract Documents."
   2. Add the following paragraphs:
      a. "13.8 NON-DISCRIMINATION
      b. "13.8.1 During the performance of this Contract, the Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, creed, sex or national origin. The Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, creed, sex, or national origin. Such actions shall include, but not to be limited to, the following: employment, up-grading, demotion or transfer, recruitment advertising, layoffs or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this clause.
      c. “A13.8.2 The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, creed, sex, or national origin.@
      d. A13.8.3 The Contractor will send to each labor union or representative of workers with which the Contractor has a collective bargaining agreement or other contract or understanding, a notice to be provided by or at the direction of the federal government, advising the labor union or workers' representative of the Contractor's commitments under the Contract and shall post copies of the notice in conspicuous places available to employees and applicants for employment.@
      e. A13.8.4 The Contractor will include the provisions of this clause in every subcontract or purchase order entered into in connection with the Work and will require subcontractors to include such provisions in any sub-subcontracts or purchase orders entered into in connection with the Work.@
      f. A13.8.5 (HUD projects only) The Contractor and all subcontractors will comply with all provisions of Executive Order 11246 (30 FR 12319, September 28, 1965), as amended, the rules, regulations, and relevant orders of the Secretary of Labor, and the regulations of HUD.@

K. Article 14 - Termination or Suspension of the Contract
   1. Add the following clause to 14.2.1:
      a. 14.2.1.5 the Contractor is adjudged a bankrupt.

L. Article 15 - Additional Articles
   1. Add the following clauses:
      a. 15.1 The General Contractor shall be responsible to contact the Architect as necessary to determine Sales Tax requirements for the project. Sale Taxes shall be included in all presentations of project costs, unless otherwise specified by the Owner that the project is to be treated as tax exempt.
      b. 15.2 HUD SECTION 3 CLAUSE (HUD PROJECTS ONLY)
      c. 15.2.1 The requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (ASection 3") will govern the work to be performed under this Contract. The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by Section 3 shall, to the greatest extent feasible, be directed to low- and very low-income persons and to business concerns that employ low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
      d. 15.2.2 The parties to this contract agree to comply with HUD's regulations in 24 CFR part 135, which implement Section 3 (the "Regulations") and hereby certify that they are under no contractual or other impediment that would prevent their compliance with the Regulations.
      e. 15.2.3 The Contractor agrees to send to each labor organization or representative of workers with which the Contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organizations or workers' representative of the Contractor's commitments to hiring low-income persons in accordance with the Regulations and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the hiring preference and shall set forth the minimum number of job titles subject to hire, the availability of apprenticeship and training positions, the qualification for each, the name and location of the person(s) taking applications for each of the positions, and the anticipated date the work will begin.
      f. 15.2.4 The Contractor agrees to include the low-income hiring requirement in every subcontract for Work in connection with the Project and agrees to take appropriate action, as provided in an application provision of the subcontract or in the Regulations upon a finding that the subcontractor is in violation of the low-income hiring requirements set forth in the Regulations. The Contractor will not subcontract with any subcontractor where the Contractor has notice or knowledge that the subcontractor has been found in violation of the Regulations.
      g. 15.2.5 The Contractor hereby certifies that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the Contract is executed, and (2) with persons

other than those to whom employment opportunities must be directed, were not filled to circumvent the Contractor's obligations to comply with the Regulations.

h. 15.2.6 The Contractor's noncompliance with the Regulations may result in sanctions, termination of this Contract for default, and debarment or suspension from future contracts and from future HUD-assisted contracts.

i. 15.2.7 The Contractor agrees to abide by the requirements of Section 3 and the Regulations and will also cause such requirements to be inserted in any subcontracts entered into with third parties for covered by this Contract.

j. 15.3 PREVAILING WAGE CLAUSE (HUD PROJECTS ONLY)

k. 15.3.1 The Contractor and all subcontractors shall pay all laborers and mechanics employed or working upon the site of the Work, unconditionally and not less often than once a week, the full amount of wages and bona fide fringe benefits due at the time of payment, computed at rates not less than those contained in the wage determination of the Secretary of Labor in effect on the date of the Contract and attached hereto. The Contractor shall provide the appropriate wage determination (including any additional classification and wage rates conformed under 29 C.F.R./Part 5.5 (a)(1)(ii)), and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the Work in a prominent and accessible place where it can be easily seen by the workers. The Contractor will follow HUD and Department of Labor guidelines in determining the job classifications, wages, and fringe benefits that apply and in making timely payments to employees.

l. 15.3.2 The Contractor will maintain payrolls and basic records relating to payrolls during the course of the Work and preserve for a period of three years thereafter for all laborers and mechanics working at the site of the Work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or cost anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in the Section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid.

m. 15.3.3 The Contractor agrees to include the provisions of this clause in every subcontract entered into in connection with the Work and to require each subcontractor to include such provisions in any sub-subcontracts made in connection with the Work.

n. 15.3.4 The Contractor and all subcontractors will comply with all regulations of HUD and of the Department of Labor that are applicable to the Project with respect to the payment of wages and fringe benefits under the Davis-Bacon Act.

M. Correlation, Intent and Interpretation

1. The specifications, drawings and directions furnished by the Architect are intended to cooperate and agree. The drawings and specifications shall be interpreted by the Architect according to spirit and intent of same, without any extra charge whatsoever, and if any discrepancies or variations appear between any of the drawings or specifications, such discrepancies shall be interpreted by the Architect.
2. Anything shown on the plans and not mentioned in the specifications or vice versa must be furnished by the Contractor without extra compensation. Furthermore, if any materials or work is required which is absolutely necessary to carry out the full meaning and intent of the plans and specifications, the Contractor hereby agrees to consider and allow for the same as fully as if they are so noted and to perform the work without extra charge or claim for extra compensations.

N. Drawings

1. No dimensions are to be presumed by the Contractor, nor are the drawings to be scaled on the job. If there appears to be a variation between the written dimension and the scale of the drawing, the written dimension will govern in all cases.

O. Progress Schedule

1. The General Contractor shall provide a progress schedule (such as bar chart) for Architect's review and shall update same as required throughout the course of the project. This schedule shall show the order in which the Contractor proposes to perform the work and dates contemplated for starting and completing the work within the Time of Completion specified in the Notice to Proceed. The information provided on the form shall be realistic and consistent with the Schedule of Amounts for Contract Payments.

P. Progress Meeting

1. The Owner may request at will that all principals of performing Contractors be gathered in meeting for the purpose of discussion relating to work progress, coordination of operation delays, clarification, time schedules, etc. Notification will be issued by authorized person and attendance will be mandatory one (1) per week (maximum). Contractor shall conduct scheduled progress meetings at monthly intervals. Coordinate dates of meetings with review of payment requests. Attendees shall include: HUD Inspector (if applicable), Project Manager, Project Superintendent, Inspecting Architect, Owner representative, subcontractors, and other concerned parties.

Q. Field Measurements

1. The Contractor shall obtain his own lines and/or grades, and shall assume all responsibility for the accuracy of same. He shall reconcile all measurements and conditions on the site of proposed work.

R. Alternate Construction

1. In case quantitative alternates are accepted, the substitute materials and/or items shall be used so that the resulting design and arrangement shall resemble that in the base bid as nearly as possible.

S. Adjustment to Building Conditions

1. The locations and arrangement of the various parts of the installations are indicated on the drawings and the parts shall be installed as approximately shown thereon. Any change necessary to pass immovable obstructions shall be made by the Contractor without additional cost. Under no circumstances shall any sizes be decreased or radical changes be made in any part of the installation without the written consent of the Architect.

T. Permits and Fees
1. The General Contractor shall obtain and pay for the general building permit and shall obtain the occupancy permit. All other required permits (mechanical, plumbing, electrical, etc.), as well as tap fees, etc. shall be obtained and paid for by the respective Contractor responsible for the work. Each Contractor shall arrange for all required inspections of his work and submit documentation to the General Contractor that they have been completed.

U. Codes
1. All work on this project shall be in accordance with all applicable federal, state and local codes and regulations having jurisdiction over this project.

V. Record Drawings/Operation & Maintenance Manual
1. At the completion of the project, each Contractor shall submit two (2) sets of plans and specifications which have been marked in red to indicate all changes made documenting construction which deviates from the original contract documents. These shall constitute the Aas-built@ drawings. The Contractor shall furnish a minimum of two (2) complete hard-copy sets and two (2) complete electronic (CD) sets of operation/maintenance manuals to the Architect for Owner's use, the Contractor=s files, and Architect=s files. Each subcontractor shall cooperate with the General Contractor and provide full information (including complete cut sheets) of all equipment, fixtures, etc., included within their scope of work.

W. Schedule of Values
1. Before the first Application for Payment, the Contractor shall submit to the Architect a schedule of values allocated to the various portions of the work, supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used only as a basis for the Contractor's applications for payment.

X. Barricades and Warnings
1. Contractor shall construct and maintain all barricades as required to provide protection to the public and to the work. Danger signals, warning signs, red flags, lanterns and lights shall be provided and maintained as needed. All the above shall comply with all applicable codes and ordinances.

Y. Construction Signs
1. Within ten (10) days of commencing work, the General Contractor will furnish and erect one (1) construction sign at the site located as directed by the Architect. The sign shall be 8'-0" x 6'-0" with the design and layout as directed by the Architect. The layout will be issued to the Contractor at the pre-construction conference. No other sign or advertising device will be permitted on the premises except upon the express approval of the Architect and subject to mutual agreement with the Owner concerning extent and arrangement of such device.

Z. "Or Equal"
1. Where phrase "or equal", or "or equal as approved by the Architect" or "or Architect approved equal" occurs in the Contract Documents, do not assume that material, equipment or methods will be approved as equal by the Architect unless the item has been approved for this work in writing by the Architect.

AA. Colors
1. Unless the precise color is specifically described in the Contract Documents, whenever a choice of color is desired, submit accurate color charts and samples to the Architect for review and selection.

BB. Availability of Specified Items
1. Verify, prior to bidding, that all specified items will be available in the time table required for orderly and timely installation so as not to impede the progress of the work.
2. In the event specified item or items will not be available, so notify the Architect a minimum of ten (10) working days prior to receipt of bids.

CC. Project Superintendent
1. The project superintendent shall be satisfactory to the Owner; thus, the Contractor shall assign a superintendent only after the Owner has reviewed the superintendent's qualifications, is aware of who the superintendent will be and approves of such. A change in the superintendent can occur only after written authorization of the Owner.

DD. Pre-Construction Conference
1. A pre-construction conference will be scheduled by the Architect. The meeting shall include the General Contractor (including the Project Manager and Project Superintendent), the Architect (including the Inspecting Architect), the Owner, subcontractors, suppliers, utility representatives, and other concerned parties. At the time of the pre-construction conference, but not later than ten (10) days after official notification of the Contract Award, the Contractor shall submit the following to the Architect.
   a. _____Certificate of Liability Insurance
   b. _____Schedule of Construction (Bar Graph Preferred)
   c. _____Schedule of Values
2. The meeting agenda will include discussion of:
   a. Critical sequencing, use of the premises
   b. Utility installation and Coordination
   c. Change Order procedures
   d. Use of Standard Field Report

e. Exchange of contact information
f. Engineering/Construction Requirements
g. Draws and Draw schedules
h. Equal Opportunity and Labor Standards
i. Notice of anticipated completion (90 days) policy and delivery procedures

EE. Anchor Bolts, Sleeves, etc.
1. Where any apparatus to be installed requires anchor bolts, these shall be furnished and set to template by the respective Contractors whose apparatus requires same. Where conduits pass through walls, floors or roof, sleeves consisting of sheet metal or steel pipe 1" larger than the required opening and extending flush with finished face shall be set by the Contractor requiring their use. Same Contractor to seal sleeve as required by any and all local or state codes.

FF. Equipment, Final Connections, etc.
1. Unless otherwise shown and/or selected, all special furnishings and/or equipment will be furnished and installed by the equipment contractor. Each equipment vendor shall furnish all switches, outlet boxes, trim, safety devices, tail pieces, etc., unless specifically noted otherwise. Unless otherwise noted, the Contractor will bring services to indicated locations and make final connections to all equipment and this will include labor and material from the rough-in location to tail pieces, outlet boxes, etc.

GG. Lead Paint
1. No lead-based paint shall be used on this project, and no new material or product that contains leadbased paint shall be used on this project.

HH. Asbestos Materials
1. No asbestos or asbestos containing materials or products shall be used on this project. Further, the Architect and/or the Owner shall have the right to demand from the Contractor, subcontractor, material supplier and/or manufacturer a dated, signed and notarized certification stating that the building product contains no asbestos materials. Failure or refusal on the part of the Contractor, subcontractor, material supplier or manufacturer to furnish said certification shall be just cause to withhold future payments or release of retainage to the Contractor.

II. Occupational Safety & Health Act
1. Each Contractor and all Subcontractors are hereby reminded that this Project is subject to the procedures and regulations of the Williams-Steiger Occupational Safety & Health Act, current edition with pertinent amendments. Along with the obligation to comply with those procedures and regulations, pay particular attention to and comply with the requirements of the Hazardous Communications Act. Each Subcontractor is responsible to obtain from the General Contractor (and acknowledge receipt of same) written Safety and Hazardous Communication Program material as required by OSHA pursuant to title 29CFR, subpart D, part 1296.59.

JJ. Hazardous Materials
1. Any hazardous materials uncovered and/or discovered by any Sub-Contractor during the course of the work are to be completely removed and disposed of by the Sub-Contractor. All Work, including disposal shall be in complete conformance with all Federal, State and local regulations.

KK. Material Safety Data Sheets
1. Each Subcontractor is required to deliver all material safety data sheets pertaining to material Subcontractor brings on-site to General Contractor at General Contractor=s on-site office.

LL. Liquidated Damages
1. The Contract amount will be reduced by .25% per day or $200.00 (whichever is greater) for each day the work remains incomplete after the contract date set forth in their contract. Acts of God@, such as weather, will be taken into consideration when reviewing the completion date. If the work is being manned properly with skilled, experienced labor on a timely basis, there should be no need for liquidated damages to be incurred. Typically, this clause has not been exercised except when nonperformance appears to be intentional and scheduled building completion dates are put in peril. The completion days will not begin to run until the Contractor has been notified to commence.

MM. Cleaning Up
1. Cleaning up is critical, both during the course of the work and when the work is completed. Each Subcontractor is responsible for cleaning his work area daily, including removing all rubbish from the buildings and placing same in the large waste containers located throughout the project, provided by the General Contractor. In the event Subcontractor does not satisfactorily complete daily cleanup or cleaning at the conclusion of the work, the General Contractor will cause the required cleanup to be completed and the Subcontractor will be charged. At completion of the work of all trades, the Contractor shall remove all temporary protection and clean adjacent surfaces.
2. The Contractor shall be responsible for cleaning and polishing floors; cleaning all painted, decorated or stained surfaces; cleaning and polishing all hardware and cleaning all tile work, fixtures and equipment, etc. Reference Cleaning: Section 01569

NN. Substantial Completion
1. Prior to final acceptance and at the request of the Contractor, the Owner/Architect may inspect and prepare a comprehensive Punch List for each of the respective phases or all of the Work. It shall be the responsibility of each Contractor to complete all items of the Owner/Architect's Punch List prior to application for final payment.

OO. Payments and Completion
1. Within forty-five (45) days after approval by Architect, the Owner will pay to the Contractor ninety percent (90%) of the value of all work performed and all materials suitably stored on the site, up to the first day of the month

less the aggregate of previous payments. No payments will be made for materials stored off site. In order to be considered timely, Contractor shall submit copies of the following to Architect no more than four (4) working days after the first day of the month:

a. _____Six (6) copies of invoice utilizing latest revised addition of the AIA Documents G702 & G703 for conventional projects, and HUD form 92448 Contractor's Requisition for HUD projects.
b. _____Six (6) Partial Waivers of Liens from General Contractor, all Subcontractors, & Material Suppliers

2. After final review and acceptance of the work by the Architect and the Owner, the Contractor shall submit for final payment. Final payment will be paid sixty (60) days after the following close out documents are received:
   a. _____Six (6) sets of Final Request for Payment, AIA Documents G702 and G703 for conventional projects, and HUD form 92448 AContractor=s Requisition@ for HUD projects.
   b. _____Six (6) Final Waivers of Lien from General Contractor, all Subcontractors, & Major Material Suppliers
   c. _____Two (2) copies of all manufacturer's warranties
   d. _____Two (2) sets of all operation/maintenance manuals
   e. _____Two (2) copies of record drawings ("as-builts")
   f. _____Two (2) copies (including one original) of fully executed Certificate of Occupancy (if applicable)
   g. _____Two (2) copies of Contractor's affidavit of payment of debts and claims, AIA Document G706.
   h. _____Two (2) copies of Contractor's affidavit of release (waiver) of liens, AIA Document G706A.
   i. _____Two (2) copies of Consent of surety company to final payment, AIA Document G707.
   j. _____Two (2) copies of Evidence of completion requirements of governing authorities.
   k. _____Two (2) copies of Certificate of Occupancy (if temporary note why and when permanent CO is to be issued).
   l. _____Two (2) copies of Certificate of Inspection from all required agencies and departments having jurisdiction.
   m. _____Two (2) copies of HUD Form No. 2485 B Permission to Occupy (if applicable).

PP. Warranties and Guarantees

1. The Contractor shall guarantee the quality of construction for a period of one (1) year (minimum) against defects in workmanship and materials. The Contractor will, at his own expense, make any and all repairs that may be necessary as a result of defects in workmanship and/or materials supplied by the Contractor. The guarantee period shall begin on the date of substantial completion of the project as declared by the Architect. The Contractor's guarantee for construction shall be submitted to the Architect for the Owner on the Contractor's company letterhead in the form prescribed by the Architect. Refer to individual specification sections for additional guarantee requirements.
2. The Contractor shall assemble two (2) copies of all manufacturer's warranties for all guaranteed products and materials for this project. These warranties are not to supersede or exempt the Contractor's guarantee for construction but to act in conjunction with such guarantee.

QQ. Debriefing Meeting

1. A post-construction Debriefing Meeting will be scheduled by the Owner. The meeting shall include the General Contractor (including the Project Manager and Project Superintendent), the Architect (including the Inspecting Architect), and the Owner.

END OF SECTION 00800

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General Conditions of the Contract for Construction

THIS IS A MODIFIED AIA CONTRACT

for the following PROJECT:
(Name and location or address)

«**St. Theresa Village Rehabilitation** »
«6783 Siebern Avenue »
«Cincinnati, Ohio 45236»

THE OWNER:
(Name, legal status and address)

«**St. Theresa Senior Housing Limited Partnership**,
an Ohio limited partnership»
«2245 North Bank Drive »
«Columbus, OH 43220 »

THE ARCHITECT:
(Name, legal status and address)

«**Berardi + Partners** »«**LLC** »
«1398 Goodale Boulevard »
«Columbus, OH 43212 »

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1 GENERAL PROVISIONS

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12 UNCOVERING AND CORRECTION OF WORK

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13 MISCELLANEOUS PROVISIONS

14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the "Agreement") and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect or the Owner. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor (except as set forth in Section 5.3 and Section 5.4), (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

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§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties may use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, or other agreed documents,

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shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

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§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall, after receipt of a written request from the Contractor, furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

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§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Owner and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.3.4 The Contractor shall use reasonable care in locating, before performing any Work, all above and below-ground utilities on or about the Project, and shall use reasonable care to avoid damaging any such utilities, including, but not limited to, service and transmission facilities for electricity, communication, water, sewer, and gas.

§ 3.3.5 Smoking and Tobacco Products. All of the Owner's buildings are smoke free. Smoking and other tobacco products are not be permitted in any indoor, outdoor, or parking areas at the Project site throughout the Project duration. The Contractor shall enforce these restrictions on any individual employed by the Contractor or a Subcontractor or a Sub-Subcontractor.

§ 3.3.6 Firearms and Weapons Prohibited. No person, including any person licensed to carry a concealed weapon, shall bring or possess a firearm or any other weapon on the Project site or at any Project-related function or activity.

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§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Owner or Architect in accordance with Section 3.12.8 or ordered by the Owner or Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Owner or Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect

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shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site on a full-time basis during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. During the period between the date of commencement of the Work and the date of Substantial Completion, the Contractor's superintendent shall not be involved with any work other than the Project.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Owner or Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Owner or Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

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§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Owner and Architect's approval. The approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.10.4 On a weekly basis, the Contractor shall provide a Weekly Project Report to the Owner and Architect. The Weekly Project Report shall include progress updates for completed and future work with photographs, a short interval construction (SIP) schedule, and other content at the discretion of the Owner.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

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§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste

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materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and officers, trustees, agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), including loss of use resulting therefrom, but only to the extent caused by the negligent or other Intentionally wrongful acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor, Subcontractor under workers' compensation acts, disability benefit acts, other employee benefit acts, or any insurance policy provided or required in connection with the Project. The Contractor hereby specifically and expressly waives any immunity afforded it by virtue of any applicable state constitutional or statutory protections, but only to the extent required to honor the indemnity obligations set forth in this Section 3.18.

§ 3.18.3 The Contractor shall indemnify and hold harmless all of the parties indemnified under this Section 3.18 from and against any costs and expenses (including reasonable attorneys' fees) they incur in enforcing any of the Contractor's defense, indemnity, and hold-harmless obligations under this Contract.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment.

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The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Owner and Architect have authority to reject Work that does not conform to the Contract Documents. Whenever the Owner or Architect considers it necessary or advisable, the Owner or Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Owner or Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Owner and Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

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§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify, in writing, the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Owner or Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Owner or Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract

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Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- **.1** assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- **.2** assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any

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revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Owner and Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. Except as provided in Sections 15.1.5 and 15.1.6, the Contractor shall not be entitled to an increase in the Contract Sum or to an extension of the Contract Time, or both, on account of any change in the Work that is not the subject of a Change Order or Construction Change Directive prior to the commencement of such Work.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Owner or Architect.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work. Except as permitted in Section 7.3, a change in the Contract Sum or the Contract Time shall be accomplished only by Change Order.

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§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- **.1** The change in the Work;
- **.2** The amount of the adjustment, if any, in the Contract Sum; and
- **.3** The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- **.1** Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- **.2** Unit prices stated in the Contract Documents or subsequently agreed upon;
- **.3** Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- **.4** As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- **.1** Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- **.2** Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- **.3** Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- **.4** Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- **.5** Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and

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credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Owner or Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Owner and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Owner and the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

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§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Owner and Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Owner or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Owner and Architect and supported by such data to substantiate its accuracy as the Owner and Architect may require, and unless objected to by the Owner or Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be on AIA Document G701/703 (latest edition), notarized, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance in writing by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.3.4 As a condition precedent to the Contractor's entitlement to payment on account of an Application for Payment, the Contractor shall submit with each Application for Payment:

.1 a partial conditional lien waiver from the Contractor for the total payment requested in the Application for Payment;

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.2 a partial conditional lien waiver from all Subcontractors on whose account the Contractor is seeking payment in the Application for Payment for the total amount of such payment requested;

.3 a partial unconditional lien waiver from the Contractor for the sum of all previously paid progress payments (not applicable to the Contractor's first Application for Payment) and not applicable to retainage;

.4 unless previously provided, a partial or final unconditional lien waiver from each Subcontractor on whose account the Contractor previously sought and received payment for the sum of all such previously paid payments;

.5 a notarized statement from the Contractor certifying that: (1) the Application for Payment is correct; (2) the Contractor is entitled to payment of the amounts requested; and (3) all due and payable bills with respect to the Work have been paid in full or will be paid in full from the proceeds of the Application for Payment;

.6 an application for payment on AIA Document G702/G703 to the Contractor from every Subcontractor on whose account the Contractor is seeking payment in the Application for Payment;

.7 any other information required by the Contract Documents to be submitted with an Application for Payment;

§ 9.3.5 If a Subcontractor or Sub-subcontractor refuses to furnish a required lien waiver, the Contractor shall furnish a bond satisfactory to the Owner which indemnifies the Owner from the lien or potential lien from the Subcontractor or Sub-subcontractor. Such bond shall be in addition to the payment and performance bonds, if any, required under the Agreement. All lien waivers and bonds in lieu of lien waivers shall be on forms approved in advance by the Owner.

§ 9.3.6 All lien waivers shall be on the forms attached as an exhibit to the Agreement unless a Project lender requires otherwise.

§ 9.3.7 If any Subcontractor, Subcontractor of any tier, material supplier, laborer, or other person performing services or providing labor or materials under the Contractor files a lien claim against the Project site, and such lien claim does not result from the Owner's failure to make payment when due under this Agreement, then the Contractor shall promptly settle or bond such lien claim.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to

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make such representations to the Owner. The Architect may also withhold a Certificate for Payment or because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is, or may be, responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** liens or third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a Separate Contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- **.7** repeated failure to carry out the Work in accordance with the Contract Documents; or
- **.8** representations made by the Contractor that are not true.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1, or at the Owner's own initiative, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, but subject to the Owner's right to approve payment in whole or in part, or if the Owner approves payment in the absence of a Certificate for Payment issued by the Architect, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect. The Owner may decline to approve payment in whole or in part to such extent as may be necessary in the Owner's opinion to protect the Owner from loss for which the Contractor is or may be responsible.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

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§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

§ 9.7.1 Subject to the other provisions of the Contract Documents to the contrary, if the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount (i) certified by the Architect and approved by the Owner, (ii) approved by the Owner in the absence of a Certificate for Payment by the Architect or (iii) awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Owner and Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Owner (and the Architect, if the Owner requests) will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Owner or Architect. In such case, the Contractor shall then submit a request for another inspection to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Owner or Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. within thirty (30) days of the date on which it receives the list or within such other time period set forth in the Certificate of Substantial Completion. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety, if any, and subject to the Owner's right to withhold payment, the Owner shall make payment of retainage applying to

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the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.8.6 A Certificate of Substantial Completion may be withdrawn by the Architect or Owner based on subsequently discovered information that would have otherwise permitted the Architect or Owner to determine that the Work was not Substantially Complete if known at the time of the issuance of the Certificate of Substantial Completion.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Owner and Architect will promptly make such inspection. When the Owner finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. Notwithstanding any other provision of the Contract to the contrary:

.1 If this Contract involves the construction or rehabilitation of a Project financed by the United States Department of Housing and Urban Development ("HUD") or other Project lender, the Owner's receipt of authorization from HUD to disburse funds or the Owner's receipt of funds from the lender (as appropriate) is a condition precedent to the Owner's obligation to make the final payment to the Contractor.

.2 The date of final completion of the Work is the date determined by the Owner when all Work is complete, accessible, operable and usable by the Owner and all parts and systems are one hundred percent (100%) complete and cleaned for the Owner's full use and all drawings, certificates, bonds, guarantees, and documents required by the Contract Documents have been provided to the Owner by the Contractor.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties as well as a list of names, telephone numbers and email addresses of all subcontractors and material suppliers providing the warranties or guarantees, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases

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and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner, (7) a Certificate of Occupancy (and other permits identified by the Architect and its sub-consultants in the Contract Documents) from the governmental authority having jurisdiction over the Project, (8) a final accounting for the cost of the Work, (9) Contractor Cost Certification conforming to the requirements of the Owner's stakeholders, final documents required by the Owner's stakeholders as identified n Exhibit J including Section 3 and MBE/WBE/DBE reports, if required, (10) all maintenance and operation manuals, field record drawings and specifications representing "As Built" conditions, (11) all sustainability and green rater required reports and any other documentation required under any green certification for which the Project is eligible, and(12) all environmental clearance documents as required for abatement activities, if applicable. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

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§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter and to provide notice to insurers.

§ 10.2.9 The Contractor shall promptly report in writing to the Owner and Architect all accidents arising out of or in connection with the Work that cause death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if an accident results in death, serious personal injury, or serious damage, the accident shall be reported immediately by telephone or messenger to the Owner and Architect.

§ 10.3 Hazardous Materials and Substances
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from

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performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's and Subcontractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as set forth in the Insurance Requirements attached to the Agreement as Exhibit B..

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.1.1 Property Insurance

If the Project involves construction of a new building or an increase in the footprint of an existing building, the Owner shall provide and maintain a builder's risk insurance policy written on a special causes of loss form and an open-perils basis providing coverage for direct physical loss of or damage to covered property arising from insured perils that shall not exclude: theft; fire; vandalism; malicious mischief; earthquake; earth movement; tornado; lightening; explosion; breakage of glass; flood; windstorm; collapse; water damage; hot and cold testing; debris removal and/or demolition occasioned by enforcement of applicable law; sudden and accidental equipment breakdown; and resulting from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials.

.1 The property insurance shall cover the Project in the course of construction including false-work, temporary buildings and structures, and materials used in the construction process, stored on or off-site, or while in transit.

.2 The coverage shall be written on a replacement-cost basis in an amount equal to not less than the initial Contract Sum, plus the value or: (1) all subsequent Modifications; (2) materials supplied and installed by others; and (3) any furnishings, fixtures, materials, or equipment located at the Site. All sub-limits of coverage are subject to the prior written approval of the Owner.

.3 The property insurance shall not include any deductible of more than $25,000 per occurrence for the "all-risk perils." Deductibles for other perils may be higher.

.4 The insureds under the policy shall include the Owner, Contractor, Subcontractors at all tiers, and Separate Contractors.

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.5 Coverage shall include the reasonable extra costs of acceleration and expediting temporary and permanent repairs to, or permanent replacement of, damaged property. Those covered costs shall include overtime wages and the extra costs of "express" or other means for rapidly transporting materials and supplies necessary to the repair or replacement.

.6 Coverage shall include provisions for mechanical or electrical breakdown, or boiler system testing if a boiler system is part of the Work.

.7 Coverage shall include temporary structures and scaffolding, along with collapse coverage.

.8 Coverage shall be primary to all other applicable insurance.

.9 The policy shall specifically permit and allow for partial occupancy as defined under the Contract Documents and for partial occupancy or a similar term as used under the policy.

.10 The policy shall be maintained in effect until Substantial Completion of all Work.

.11 The tools and equipment of the Contractor and all Subcontractor's at every tier shall not be covered under the property insurance. It is the sole responsibility of the Contractor and all Subcontractor's at every tier to maintain such coverage.

§ 11.2.1.2 If the Project is solely the installation of material and equipment and not new building construction, the Owner may in its discretion purchase and maintain a builder's risk, builder's risk-renovations, or installation floater insurance policy meeting the requirements below. Owner's standard property insurance shall be maintained:

.1 The Contractor shall be named as an additional insured on the insurance policy.

.2 The property insurance shall not include any deductible of more than $25,000 per occurrence for the "all-risk perils." Deductibles for other perils may be higher.

.3 Coverage for property while at a temporary location.

.4 Coverage for property while in transit.

.5 Coverage shall include testing.

.6 Coverage shall include business income and extra expense.

.7 Coverage shall include earth movement.

.8 Coverage shall include flood insurance (this does not apply to covered property at any Project Site or temporary location in any area designated by the Federal Emergency Management Agency as Flood Zones A, B, Shaded X, D, or V as designated as a "Special Floor Hazard Area (SFHA), "Flood Prone Area," "Not Mapped," or "Undesignated Flood Hazard."

.9 Coverage shall include a limited mold policy.

.10 Coverage shall include water intrusion.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. If an actual lapse in coverage occurs, then, unless that lapse arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice of the actual lapse from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

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§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Owner's or Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Owner or Architect, be uncovered for the Owner or Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Owner or Architect has not specifically requested to examine prior to its being covered, the Owner or Architect may request to see such Work and it shall be uncovered

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by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Owner or Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

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§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, or elsewhere in the Contract Documents, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing or credit enhancement. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Owner and Architect timely notice of when and where tests and inspections are to be made so that they may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

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§ 13.6 Publicity, Photography, and Awards

§ 13.6.1 Before completion of the Project, the Owner alone shall control all public relations or publicity about the Project, and the Contractor shall not make any public statement about the Project without the Owner's prior written consent.

§ 13.6.2 After completion of the Project, the Contractor may exercise reasonable public relations and marketing efforts related to the Project, provided that the Contractor (1) properly identifies the Owner and the Architect and their participation in the Project and (2) complies with the Owner's related requests and requirements.

§ 13.6.3 The Contractor shall obtain the Owner's prior written consent and will be subject to the Owner's related requirements before the Contractor commissions, takes, publishes, or otherwise uses any photographs of the Project. The foregoing requirement does not apply to the photographs taken in the normal course of construction or the use of those photographs to facilitate the completion of the Work.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- **.3** Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- **.4** The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- **.1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- **.3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

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.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
.2 Accept assignment of subcontracts pursuant to Section 5.4; and
.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;
.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by

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applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by written notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.5, Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on a critical element of the scheduled construction. The Contractor shall not be entitled to an increase in the Contract Time on account of any delaying impact on a non-critical element of the Work. The Contract Time will not be adjusted on account of the impact of any adverse weather on any of the Work until or unless such number of days of impact exceed the number of Adverse Weather Days provided in the Contract Time.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- **.1** damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- **.2** damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents

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§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of the Claim's substantiating documentation, if any, take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

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§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

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AIA® Document A102™ – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is the Cost of the Work Plus a Fee with a Guaranteed Maximum Price

N^^ Revised Template (D&S4Nov24)

THIS IS A MODIFIED AIA AGREEMENT

AGREEMENT made as of the «_____ » day of «_____ » in the year «2026 »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

«**St. Theresa Senior Housing Limited Partnership**, an Ohio limited partnership»
«2245 North Bank Drive »
«Columbus, OH 43220 »
« »

and the Contractor:
(Name, legal status, address and other information)

«**Model Construction,** »«**LLC** »
«1826 Race Street »
«Cincinnati, OH 45202 »
« »

for the following Project:
(Name, location and detailed description)

«**St. Theresa Village Rehabilitation**»
«6783 Siebern Avenue »
«Cincinnati, Ohio 45236»

The Architect:
(Name, legal status, address and other information)

«**Berardi + Partners** »«**LLC** »
«1398 Goodale Boulevard »
«Columbus, OH 43212 »
« »

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A102™–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. If anything in the other Contract Documents, other than a Modification, is inconsistent with this Agreement, this Agreement shall govern. An enumeration of the Contract Documents, other than a Modification, appears in Article 16.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 RELATIONSHIP OF THE PARTIES

The Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the Owner to cooperate with the Architect and exercise the Contractor's skill and judgment in furthering the interests of the Owner; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the Owner's interests. The Owner agrees to furnish and approve, in a timely manner and as reasonably necessary for the Work, information requested by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

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ARTICLE 4 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 4.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[« »] The date of this Agreement.

[«X»] A date set forth in a notice to proceed issued by the Owner.

[« »] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

« »

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 4.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 4.3 Substantial Completion

§ 4.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

[«X»] Not later than «XXX» («XXX») calendar days from the date of commencement of the Work.

[« »] By the following date: « »

§ 4.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 4.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 4.3, liquidated damages, if any, shall be assessed as set forth in Section 5.1.6.

§ 4.3.4 The Contract Time upon which the date of Substantial Completion is based shall include zero (0) days of anticipated weather days ("Adverse Weather Days").

ARTICLE 5 CONTRACT SUM

§ 5.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum is the Cost of the Work as defined in Article 7 plus the Contractor's Fee.

§ 5.1.1 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work, or other provision for determining the Contractor's Fee.)

The Contractor's Fee is comprised of General Requirements, Overhead, and Profit.

1. General Requirements as defined in the respective state's tax credit cost certification funding source documents attached as Exhibit J to this Agreement are included as a lump sum equal to 6% of the total of Cost of the Work in the original Guaranteed Maximum Price. -General Requirements is capped at 6% multiplied by the Cost of the Work

2. Overhead is equal to 2% multiplied by the Cost of the Work.

3. Profit is equal to 6% multiplied by the Cost of the Work.

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§ 5.1.2 The method of adjustment of the Contractor's Fee for changes in the Work:

«For changes in the Work, the Contractor's Profit and Overhead shall not be adjusted and shall remain equal to the percentage of the Cost of the Work as stated in Section 5.1.1 that is directly attributable to any change incurred or paid by the Contractor during performance of the Work. Therefore, the dollar amount of the Contractor's Profit and Overhead may increase or decrease, depending on the nature of the changes in the Work, but the basis of the Contractor's Fee will remain the same. »

For Owner approved changes in the Contract Time, the Contractor's General Conditions may be adjusted on a per diem basis of $XXX /day and not as Cost of the Work.

It is expressly understood that the Contractor is responsible for meeting the Cost Certification requirements of all project financing sources as set forth in this Agreement including Section 12.2.1.5. OHFA General Contractor Cost Certification Instructions are included at Exhibit J.

§ 5.1.3 Limitations, if any, on a Subcontractor's combined overhead and profit for increases in the cost of its portion of the Work:

«Not to exceed 15% per Subcontract tier»

§ 5.1.4 Rental rates for Contractor-owned equipment shall not exceed 100%) of the standard rental rate paid at the place of the Project.

§ 5.1.5 Unit prices, if any, are identified in Exhibit I to this Agreement.
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price Per Unit ($0.00)

§ 5.1.6 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

«If the Contractor fails to substantially complete the Work by the Date of Substantial Completion, or within any extended time allowed by Change Order, the Contractor shall pay, or allow the Owner to withhold, $500 per day as liquidated damages for each day beyond the Date of Substantial Completion. The parties agree that these liquidated damage amounts are a reasonable forecast of the Owner's anticipated actual damages, which are presently impossible to ascertain, and that the amounts provided in this section shall be payable as liquidated damages and not as a penalty. »

§ 5.1.7 Other:
(Insert provisions for bonus, cost savings or other incentives, if any, that might result in a change to the Contract Sum.)

«None »

§ 5.2 Guaranteed Maximum Price

§ 5.2.1 The Contract Sum is guaranteed by the Contractor not to exceed «XXXXX» ($ «XXXXXX»), subject to additions and deductions by Change Order as provided in the Contract Documents. This maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Contractor shall meet all cost certification requirements of the lender or stakeholder. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner. The Contractor shall include in the Guaranteed Maximum Price all sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted, whether or not yet effective. Contractor shall provide Owner with a detailed line item breakdown of the costs comprising the Guaranteed Maximum Price and denote which line items Contractor intends to self-perform.

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§ 5.2.2 Alternates

§ 5.2.2.1 Alternates, if any, included in the Guaranteed Maximum Price are identified in Exhibit I to this Agreement.

Item	Price

§ 5.2.2.2 Subject to the conditions noted below, certain alternates identified on Exhibit I to this may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.

(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 5.2.3 Allowances, if any, included in the Guaranteed Maximum Price are identified in Exhibit I to this Agreement.:

(Identify each allowance.)

Item	Price

§ 5.2.4 Assumptions, if any, upon which the Guaranteed Maximum Price is based are identified on Exhibit K to this Agreement.

(Identify each assumption.)

« »

§ 5.2.5 [Not Used].

§ 5.2.6 To the extent that the Contract Documents are anticipated to require further development, the Guaranteed Maximum Price includes the costs attributable to such further development consistent with the Contract Documents and reasonably inferable therefrom. Such further development does not include changes in scope, systems, kinds and quality of materials, finishes or equipment, all of which, if required, shall be incorporated by Change Order.

§ 5.2.7 The Owner shall authorize preparation of revisions to the Contract Documents that incorporate the agreed-upon assumptions contained in Section 5.2.4. The Owner shall promptly furnish such revised Contract Documents to the Contractor. The Contractor shall notify the Owner and Architect of any inconsistencies between the agreed-upon assumptions contained in Section 5.2.4 and the revised Contract Documents.

ARTICLE 6 CHANGES IN THE WORK

§ 6.1 Adjustments to the Guaranteed Maximum Price on account of changes in the Work shall be determined by any of the methods listed in Article 7 of AIA Document A201™–2017, General Conditions of the Contract for Construction.

§ 6.2 Adjustments to subcontracts awarded on the basis of a stipulated sum shall be determined in accordance with Article 7 of A201–2017, as they refer to "cost" and "fee," and not by Articles 5, 7 and 8 of this Agreement. Adjustments to subcontracts awarded with the Owner's prior written consent on the basis of cost plus a fee shall be calculated in accordance with the terms of those subcontracts.

§ 6.3 In calculating adjustments to the Guaranteed Maximum Price, the terms "cost" and "costs" as used in Article 7 of AIA Document A201–2017 shall mean the Cost of the Work as defined in Article 7 of this Agreement and the term "fee" shall mean the Contractor's Fee as defined in Section 5.1.1 of this Agreement.

§ 6.4 If no specific provision is made in Article 5 for adjustment of the Contractor's Fee in the case of changes in the Work, or if the extent of such changes is such, in the aggregate, that application of the adjustment provisions of Article 5 will cause substantial inequity to the Owner or Contractor, the Contractor's Fee shall be equitably adjusted on the same basis that was used to establish the Fee for the original Work, and the Guaranteed Maximum Price shall be adjusted accordingly.

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ARTICLE 7 COSTS TO BE REIMBURSED

§ 7.1 Cost of the Work

§ 7.1.1 The term Cost of the Work shall mean costs necessarily incurred by the Contractor in the proper performance of the Work. The Cost of the Work shall include only the items set forth in this Article 7.

§ 7.1.2 Where, pursuant to the Contract Documents, any cost is subject to the Owner's prior approval, the Contractor shall obtain such approval in writing prior to incurring the cost.

§ 7.1.3 Costs shall be at rates not higher than the standard paid at the place of the Project, except with prior written approval of the Owner.

§ 7.2 Labor Costs

§ 7.2.1 Wages or salaries of construction workers directly employed by the Contractor to perform the construction of the Work at the site or, with the Owner's prior written approval, at off-site workshops.

§ 7.2.2 Wages or salaries of the Contractor's supervisory and administrative personnel when stationed at the site and performing Work shall be included in the lump sum General Requirements cost and/or lump sum Overhead cost and subject to a stakeholder mandated percentage cap of total Cost of Work unless specifically reviewed and approved by Owner in writing.

§ 7.2.2.1 Wages or salaries of the Contractor's supervisory and administrative personnel when performing Work and stationed at a location other than the site shall be included in the lump sum General Requirements cost and/or lump sum Overhead cost and subject to a stakeholder mandated percentage cap of total Cost of Work unless specifically reviewed and approved by Owner in writing.
(Identify the personnel, type of activity and, if applicable, any agreed upon percentage of time to be devoted to the Work.)

« »

§ 7.2.3 Wages or salaries of the Contractor's supervisory or administrative personnel engaged at factories, workshops or while traveling, in expediting the production or transportation of materials or equipment required for the Work, but only for that portion of their time required for the Work shall be included in the lump sum General Requirements cost and/or lump sum Overhead cost and subject to a stakeholder mandated percentage cap of total Cost of Work unless specifically reviewed and approved by Owner in writing.

§ 7.2.4 Costs paid or incurred by the Contractor, as required by law or collective bargaining agreements, for taxes, insurance, contributions, assessments, and benefits and, for personnel not covered by collective bargaining agreements, customary benefits such as sick leave, medical and health benefits, holidays, vacations and pensions, provided such costs are based on wages and salaries included in the Cost of the Work under Sections 7.2.1 through 7.2.3 shall be included in the lump sum General Requirements cost and/or lump sum Overhead cost and subject to a stakeholder mandated percentage cap of total Cost of Work unless specifically reviewed and approved by Owner in writing.

§ 7.2.5 If agreed rates for labor costs, in lieu of actual costs, are provided in this Agreement, the rates shall remain unchanged throughout the duration of this Agreement, unless the parties execute a Modification.

§ 7.3 Subcontract Costs

Payments made by the Contractor to Subcontractors in accordance with the requirements of the subcontracts and this Agreement.

§ 7.4 Costs of Materials and Equipment Incorporated in the Completed Construction

§ 7.4.1 Costs, including transportation and storage at the site, of materials and equipment incorporated, or to be incorporated, in the completed construction.

§ 7.4.2 Costs of materials described in the preceding Section 7.4.1 in excess of those actually installed to allow for reasonable waste and spoilage. Unused excess materials, if any, shall become the Owner's property at the completion of the Work or, at the Owner's option, shall be sold by the Contractor. Any amounts realized from such sales shall be credited to the Owner as a deduction from the Cost of the Work.

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§ 7.5 Costs of Other Materials and Equipment
§ 7.5.1 Costs of materials and equipment suitably stored off the site at a mutually acceptable location, subject to the Owner's and Lenders' prior written approval.

§ 7.6 Miscellaneous Costs
§ 7.6.1 Premiums for that portion of insurance and bonds required by the Contract Documents that can be directly attributed to this Contract.

§ 7.6.1.1 Costs for self-insurance, for either full or partial amounts of the coverages required by the Contract Documents, with the Owner's prior written approval.

§ 7.6.1.2 Costs for insurance through a captive insurer owned or controlled by the Contractor, with the Owner's prior written approval.

§ 7.6.2 Sales, use, or similar taxes, imposed by a governmental authority, that are related to the Work and for which the Contractor is liable.

§ 7.6.3 Fees and assessments for the building permit, and for other permits, licenses, and inspections, for which the Contractor is required by the Contract Documents to pay.

§ 7.6.4 Fees of laboratories for tests required by the Contract Documents; except those related to defective or nonconforming Work for which reimbursement is excluded under Article 13 of AIA Document A201–2017 or by other provisions of the Contract Documents, and which do not fall within the scope of Section 7.7.3.

§ 7.6.5 Royalties and license fees paid for the use of a particular design, process, or product, expressly required by the Contract Documents.

§ 7.6.5.1 The cost of defending suits or claims for infringement of patent rights arising from requirements of the Contract Documents, payments made in accordance with legal judgments against the Contractor resulting from such suits or claims, and payments of settlements made with the Owner's written consent, unless the Contractor had reason to believe that the required design, process or product was an infringement of a copyright or a patent, and the Contractor failed to promptly furnish such information to the Architect as required by Article 3 of AIA Document A201–2017. The costs of legal defenses, judgments, and settlements, shall not be included in the Cost of the Work used to calculate the Contractor's Fee or subject to the Guaranteed Maximum Price.

§ 7.6.6 Costs for communications services, electronic equipment, and software, directly related to the Work and located at the site, with the Owner's prior written approval.

§ 7.6.7 Costs of document reproductions and delivery charges.

§ 7.6.8 Deposits lost for causes other than the Contractor's negligence or failure to fulfill a specific responsibility in the Contract Documents.

§ 7.6.9 Legal, mediation and arbitration costs, including attorneys' fees, other than those arising from disputes between the Owner and Contractor, reasonably incurred by the Contractor after the execution of this Agreement in the performance of the Work and with the Owner's prior written approval, at the Owner's discretion.

§ 7.6.10 Expenses incurred in accordance with the Contractor's standard written personnel policy for relocation and temporary living allowances of the Contractor's personnel required for the Work, with the Owner's prior written approval.

§ 7.6.11 That portion of the reasonable expenses of the Contractor's supervisory or administrative personnel incurred while traveling in discharge of duties connected with the Work.

§ 7.7 Other Costs and Emergencies
§ 7.7.1 Other costs incurred in the performance of the Work, with the Owner's prior written approval.

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§ 7.7.2 Costs incurred in taking action to prevent threatened damage, injury, or loss, in case of an emergency affecting the safety of persons and property, as provided in Article 10 of AIA Document A201–2017.

§ 7.7.3 Costs of repairing or correcting damaged or nonconforming Work executed by the Contractor, Subcontractors, or suppliers, provided that such damaged or nonconforming Work was not caused by the negligence of, or failure to fulfill a specific responsibility by, the Contractor, and only to the extent that the cost of repair or correction is not recovered by the Contractor from insurance, sureties, Subcontractors, suppliers, or others.

§ 7.8 Related Party Transactions

§ 7.8.1 For purposes of this Section 7.8, the term "related party" shall mean (1) a parent, subsidiary, affiliate, or other entity having common ownership of, or sharing common management with, the Contractor; (2) any entity in which any stockholder in, or management employee of, the Contractor holds an equity interest in excess of ten percent in the aggregate; (3) any entity which has the right to control the business or affairs of the Contractor; or (4) any person, or any member of the immediate family of any person, who has the right to control the business or affairs of the Contractor.

§ 7.8.2 If any of the costs to be reimbursed arise from a transaction between the Contractor and a related party, the Contractor shall notify the Owner of the specific nature of the contemplated transaction, including the identity of the related party and the anticipated cost to be incurred, before any such transaction is consummated or cost incurred. If the Owner, after such notification, authorizes the proposed transaction in writing, then the cost incurred shall be included as a cost to be reimbursed, and the Contractor shall procure the Work, equipment, goods, or service, from the related party, as a Subcontractor, according to the terms of Article 10. If the Owner fails to authorize the transaction in writing, the Contractor shall procure the Work, equipment, goods, or service from some person or entity other than a related party according to the terms of Article 10.

ARTICLE 8 COSTS NOT TO BE REIMBURSED

§ 8.1 The Cost of the Work shall not include the items listed below:

- **.1** Salaries and other compensation of the Contractor's personnel stationed at the Contractor's principal office or offices other than the site office, except as specifically provided in Section 7.2, or as may be provided in Article 15;
- **.2** Bonuses, profit sharing, incentive compensation, and any other discretionary payments, paid to anyone hired by the Contractor or paid to any Subcontractor or vendor, unless the Owner has provided prior written approval;
- **.3** Expenses of the Contractor's principal office and offices other than the site office;
- **.4** Overhead and general expenses, except as may be expressly included in Article 7;
- **.5** The Contractor's capital expenses, including interest on the Contractor's capital employed for the Work;
- **.6** Except as provided in Section 7.7.3 of this Agreement, costs due to the negligence of, or failure to fulfill a specific responsibility of the Contract by, the Contractor, Subcontractors, and suppliers, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable;
- **.7** Any cost not specifically and expressly described in Article 7; and
- **.8** Costs, other than costs included in Change Orders approved by the Owner, that would cause the Guaranteed Maximum Price to be exceeded.

ARTICLE 9 DISCOUNTS, REBATES AND REFUNDS

§ 9.1 Cash discounts obtained on payments made by the Contractor trade discounts, rebates, refunds, and amounts received from sales of surplus materials and equipment shall accrue to the Owner, and the Contractor shall make provisions so that they can be obtained.

§ 9.2 Amounts that accrue to the Owner in accordance with the provisions of Section 9.1 shall be credited to the Owner as a deduction from the Cost of the Work.

ARTICLE 10 SUBCONTRACTS AND OTHER AGREEMENTS

§ 10.1 Those portions of the Work that the Contractor does not customarily perform with the Contractor's own personnel shall be performed under subcontracts or other appropriate agreements with the Contractor. The Owner may designate specific persons from whom, or entities from which, the Contractor shall obtain bids. The Contractor shall obtain bids from Subcontractors, and from suppliers of materials or equipment fabricated especially for the Work, who are qualified to perform that portion of the Work in accordance with the requirements of the Contract

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Documents. The Contractor shall deliver such bids to the Architect and Owner with an indication as to which bids the Contractor intends to accept. The Owner then has the right to review the Contractor's list of proposed subcontractors and suppliers in consultation with the Architect and, subject to Section 10.1.1, to object to any subcontractor or supplier. Any advice of the Architect, or approval or objection by the Owner, shall not relieve the Contractor of its responsibility to perform the Work in accordance with the Contract Documents. The Contractor shall not be required to contract with anyone to whom the Contractor has reasonable objection.

§ 10.1.1 When a specific subcontractor or supplier (1) is recommended to the Owner by the Contractor; (2) is qualified to perform that portion of the Work; and (3) has submitted a bid that conforms to the requirements of the Contract Documents without reservations or exceptions, but the Owner requires that another bid be accepted, then the Contractor may require that a Change Order be issued to adjust the Guaranteed Maximum Price by the difference between the bid of the person or entity recommended to the Owner by the Contractor and the amount of the subcontract or other agreement actually signed with the person or entity designated by the Owner.

§ 10.2 Subcontracts or other agreements shall conform to the applicable payment provisions of this Agreement, and shall not be awarded on the basis of cost plus a fee without the Owner's prior written approval. If a subcontract is awarded on the basis of cost plus a fee, the Contractor shall provide in the subcontract for the Owner to receive the same audit rights with regard to the Subcontractor as the Owner receives with regard to the Contractor in Article 11.

ARTICLE 11 ACCOUNTING RECORDS

The Contractor shall keep full and detailed records and accounts related to the Cost of the Work, and exercise such controls, as may be necessary for proper financial management under this Contract and to substantiate all costs incurred. The accounting and control systems shall be satisfactory to the Owner. The Owner and the Owner's auditors shall, during regular business hours and upon reasonable notice, be afforded access to, and shall be permitted to audit and copy, the Contractor's records and accounts, including complete documentation supporting accounting entries, books, job cost reports, correspondence, instructions, drawings, receipts, subcontracts, Subcontractor's proposals, Subcontractor's invoices, purchase orders, vouchers, memoranda, and other data relating to this Contract. The Contractor shall preserve these records for a period of three years after final payment, or for such longer period as may be required by law.

ARTICLE 12 PAYMENTS

§ 12.1 Progress Payments

§ 12.1.1 Based upon Applications for Payment (i) submitted to the Architect by the Contractor, and Certificates for Payment issued by the Architect and approved in writing by the Owner, or (ii) otherwise approved in writing by the Owner, the Owner shall make progress payments on account of the Contract Sum, to the Contractor, as provided below and elsewhere in the Contract Documents.

§ 12.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 12.1.3 Provided that an Application for Payment is received by the Owner not later than the «1st» day of a month and subject to the Owner's right to withhold payment as set forth in Article 9 of the AIA Document A201-2017, the Owner shall make payment of the amount certified to the Contractor not later than the «15th» day of the «following» month. If an Application for Payment is received by the Owner after the application date fixed above, payment of the amount certified shall be made by the Owner not later than 45 days after the Owner receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 12.1.4 With each Application for Payment, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor plus payrolls for the period covered by the present Application for Payment, less that portion of the progress payments attributable to the Contractor's Fee.

§ 12.1.5 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Guaranteed

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Maximum Price among: (1) the various portions of the Work; (2) any contingency for costs that are included in the Guaranteed Maximum Price but not otherwise allocated to another line item or included in a Change Order; and (3) the Contractor's Fee.

§ 12.1.5.1 The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Owner and Architect may require. The schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 12.1.5.2 The allocation of the Guaranteed Maximum Price under this Section 12.1.5 shall not constitute a separate guaranteed maximum price for the Cost of the Work of each individual line item in the schedule of values.

§ 12.1.5.3 When the Contractor allocates costs from a contingency to another line item in the schedule of values, the Contractor shall submit supporting documentation to the Owner and Architect.

§ 12.1.6 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed; or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Contractor on account of that portion of the Work and for which the Contractor has made payment or intends to make payment prior to the next Application for Payment, by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.

§ 12.1.7 In accordance with AIA Document A201–2017 and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 12.1.7.1 The amount of each progress payment shall first include:

- **.1** That portion of the Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work as determined pursuant to Section 12.1.6 by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the most recent schedule of values;
- **.2** That portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction or, if approved in writing in advance by the Owner, suitably stored off the site at a location agreed upon in writing;
- **.3** That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and
- **.4** The Contractor's Fee, computed upon the Cost of the Work described in the preceding Sections 12.1.7.1.1 and 12.1.7.1.2 at the rate stated in Section 5.1.1 or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work included in Sections 12.1.7.1.1 and 12.1.7.1.2 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

§ 12.1.7.2 The amount of each progress payment shall then be reduced by:

- **.1** The aggregate of any amounts previously paid by the Owner;
- **.2** The amount, if any, for Work that remains uncorrected and for which the Owner or Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- **.3** Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- **.4** For Work performed or defects discovered since the last payment application, any amount for which the Owner or Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017;
- **.5** The shortfall, if any, indicated by the Contractor in the documentation required by Section 12.1.4 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and
- **.6** Retainage withheld pursuant to Section 12.1.8.

§ 12.1.8 Retainage

§ 12.1.8.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

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(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

«10%»

§ 12.1.8.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

« »

§ 12.1.8.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 12.1.8.1 is to be modified prior to Substantial Completion of the entire Work, insert provisions for such modification.)

« Subject to the retainage laws of the state in which the Project is located and the requirements of Owner's Lenders, the Owner, in its sole discretion, may release and reduce retainage to 5% on each Application for Payment submitted after the Work is 50% complete, provided that the Work is being completed in accordance with the Project Schedule and within the Project budget. »

§ 12.1.8.3 Except as set forth in this Section 12.1.8.3 and in the Contract Documents, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 12.1.8. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage, such as upon completion of the Owner's audit and reconciliation, upon Substantial Completion.)

« »

§ 12.1.9 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner may pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 12.1.10 Except with the Owner's prior written approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and suitably stored at the site.

§ 12.1.11 The Owner and the Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors, and the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 12.1.12 In taking action on the Contractor's Applications for Payment the Owner and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor, and such action shall not be deemed to be a representation that (1) the Owner or Architect has made a detailed examination, audit, or arithmetic verification, of the documentation submitted in accordance with Section 12.1.4 or other supporting data; (2) that the Owner or Architect has made exhaustive or continuous on-site inspections; or (3) that the Owner or Architect has made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits, and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

§ 12.2 Final Payment

§ 12.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor within 30 days after

- **.1** the Contractor has fully performed the Contract, except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment;
- **.2** the Contractor has submitted a final accounting for the Cost of the Work and a final Application for Payment; and
- **.3** a final Certificate for Payment has been issued by the Architect in accordance with Section 12.2.2 and approved by the Owner.

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§ 12.2.2 Within 30 days of the Owner's receipt of the Contractor's final accounting for the Cost of the Work, the Owner shall conduct an audit of the Cost of the Work or notify the Architect that it will not conduct an audit.

§ 12.2.2.1 If the Owner conducts an audit of the Cost of the Work, the Owner shall, within 10 days after completion of the audit, submit a written report based upon the auditors' findings to the Architect.

§ 12.2.2.2 Within seven days after receipt of the written report described in Section 12.2.2.1, or receipt of notice that the Owner will not conduct an audit, and provided that the other conditions of Section 12.2.1 have been met, the Architect will either issue to the Owner a final Certificate for Payment with a copy to the Contractor, or notify the Contractor and Owner in writing of the Architect's reasons for withholding a certificate as provided in Article 9 of AIA Document A201–2017. The time periods stated in this Section 12.2.2 supersede those stated in Article 9 of AIA Document A201–2017. The Architect is not responsible for verifying the accuracy of the Contractor's final accounting.

§ 12.2.2.3 If the Owner's auditors' report concludes that the Cost of the Work, as substantiated by the Contractor's final accounting, is less than claimed by the Contractor, the Contractor shall be entitled to request mediation of the disputed amount without seeking an initial decision pursuant to Article 15 of AIA Document A201–2017. A request for mediation shall be made by the Contractor within 30 days after the Contractor's receipt of a copy of the Architect's final Certificate for Payment. Failure to request mediation within this 30-day period shall result in the substantiated amount reported by the Owner's auditors becoming binding on the Contractor. Pending a final resolution of the disputed amount, the Owner shall pay the Contractor the amount certified in the Architect's final Certificate for Payment and approved in writing by the Owner.

§ 12.2.3 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

« »

§ 12.2.4 If, subsequent to final payment, and at the Owner's request, the Contractor incurs costs, described in Article 7 and not excluded by Article 8, to correct defective or nonconforming Work, the Owner shall reimburse the Contractor for such costs, and the Contractor's Fee applicable thereto, on the same basis as if such costs had been incurred prior to final payment, but not in excess of the Guaranteed Maximum Price. If adjustments to the Contract Sum are provided for in Section 5.1.7, the amount of those adjustments shall be recalculated, taking into account any reimbursements made pursuant to this Section 12.2.4 in determining the net amount to be paid by the Owner to the Contractor.

§ 12.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

« » % « »

ARTICLE 13 DISPUTE RESOLUTION

§ 13.1 Initial Decision Maker

The Architect will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to the Agreement, to serve as Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

« »
« »
« »
« »

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§ 13.2 Binding Dispute Resolution
For any Claim subject to, but not resolved by mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[« »] Arbitration pursuant to Section 15 of AIA Document A201–2017

[«X»] Litigation in a court of competent jurisdiction

[« »] Other *(Specify)*

« »

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 14 TERMINATION OR SUSPENSION
§ 14.1 Termination
§ 14.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 14.1.2 Termination by the Owner for Cause
§ 14.1.2.1 If the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A201–2017, the amount, if any, to be paid to the Contractor under Article 14 of AIA Document A201–2017 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed an amount calculated as follows:

.1 Take the Cost of the Work incurred by the Contractor to the date of termination;
.2 Add the Contractor's Fee, computed upon the Cost of the Work to the date of termination at the rate stated in Section 5.1.1 or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion;
.3 Subtract the aggregate of previous payments made by the Owner; and
.4 Subtract the costs and damages incurred, or to be incurred, by the Owner under Article 14 of AIA Document A201–2017.

§ 14.1.2.2 The Owner shall also pay the Contractor fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Contractor that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 14.1.2.1.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Contractor shall, as a condition of receiving the payments referred to in this Article 14, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Contractor, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor under such subcontracts or purchase orders.

§ 14.1.3 Termination by the Owner for Convenience
If the Owner terminates the Contract for convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of or method for determining the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

«N/A »

§ 14.2 Suspension
The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017; in such case, the Guaranteed Maximum Price and Contract Time shall be increased as provided in Article 14 of AIA Document A201–2017, except that the term "profit" shall be understood to mean the Contractor's Fee as described in Article 5 and Section 6.4 of this Agreement.

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ARTICLE 15 MISCELLANEOUS PROVISIONS

§ 15.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 15.2 The Owner's representative:
(Name, address, email address and other information)

«Jason Gaulden, Vice President Construction and Predevelopment»
«National Church Residences»
«2245 North Bank Drive»
«Columbus, OH 43220 »
«Office: 614-273-3745 »
«jgaulden@nationalchurchresidences.org »

§ 15.3 The Contractor's representative:
(Name, address, email address and other information)

«Robert Keppler, President »
«Model Construction »
«1826 Race Street »
«Cincinnati, OH 45202 »
«Office: 513.559.4556 »
«bkeppler@modelgroup.net »

§ 15.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 15.5 Insurance and Bonds
§ 15.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in the Insurance Requirements attached as Exhibit B and elsewhere in the Contract Documents.

§ 15.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

« »

§ 15.7 Other provisions:

§ 15.7.1 Workforce Diversity
The General Contractor agrees to take positive steps to consider and, where appropriate, hire qualified minority and/or women-owned businesses in the procurement of services and supplies under the construction contract. The General Contractor also agrees to provide the owner with information about the minority and/or women-owned businesses chosen under the construction contract and the percentage of their participation in the project.

§ 15.7.2 Contractor's Key People
§ 15.7.2.1 The Contractor's key people for the Project include:

.1 «xxxxxxx», «Project Manager»;
.2 «Kevin Richard», «VP of Construction»;
.3 «insert name», «Superintendent»; and
.4 «insert name», «insert title».

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§ 15.7.2.2 The Contractor shall not replace any of the Contractor's key people identified above except with the Owner's prior written consent unless the person ceases to be in the Contractor's employ.

§ 15.7.3 Approval by Lender.
Notwithstanding anything to the contrary in the Contract Documents and subject to the review and approval of Contractor, this Agreement and all of its terms and conditions are subject to approval by any Project Lender. The terms of any loan agreements with any such Lender relating to the performance of the Work by the Contractor (including, without limitation, any nondiscrimination, equal opportunity, prevailing wage, or other clauses) are hereby incorporated by reference in this Contract. The Contractor acknowledges that the Owner is financing the Work with the Lender and will comply with the reasonable requirements of the Lender including, without limitation the following: (1) making the site of the Work available at reasonable times for inspection by the Lender; (2) curing defaults existing under the Contract Documents; and (3) executing a consent to assignment of the Contract Documents in a form reasonably required by the Lender and any other documents the Lender may reasonably requires, which shall not materially alter the Contractor's rights or responsibilities hereunder.

»

ARTICLE 16 ENUMERATION OF CONTRACT DOCUMENTS

§ 16.1 This Agreement is comprised of the following documents as modified for the Project:

.1 This AIA Document A102™–2017, Standard Form of Agreement Between Owner and Contractor
.2 Exhibit A - AIA Document A201™–2017, General Conditions of the Contract for Construction
.3 Exhibit B - Insurance Requirements
.4 Exhibit C - Drawings identified in the List of Drawings
.5 Exhibit D - Specifications identified in the List of Specifications
.6 Exhibit E - Lien Waiver forms
.7 Exhibit F - Payment and Performance Bond forms
.8 Exhibit G - Contractor's Schedule of Values
.9 Exhibit H - Construction Schedule
.10 Exhibit I - Alternates, Allowances and Unit Prices
.11 Exhibit J - Special Financing Related Requirements
- Equal Opportunity Clause
- MBE / WBE Outreach
- OHFA Contractor Cost Certification
- Section 3

.12 Exhibit K - Contractor's Assumptions
.13 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 16.

.15 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

« »

This Agreement entered into as of the day and year first written above.

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St. Theresa Senior Housing Limited Partnership, an Ohio limited partnership By: National Church Residences of St. Theresa, LLC, an Ohio limited liability company, its general partner		**Model Construction, LLC**
OWNER *(Signature)*		**CONTRACTOR** *(Signature)*
«Matthew D. Rule, »«President»		«Robert Keppler »«President»
(Printed name and title)		*(Printed name and title)*

DRAFT

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INSURANCE REQUIREMENTS
LIHTC PROJECTS

Rev 29Sept22

Article 1 General Insurance Requirements

1.1 Throughout the performance of the Work or longer as may be described below, the Contractor and each Subcontractor must obtain, pay for, and keep in force, the insurance coverage described in this Exhibit.

1.1.1 On a case-by-case basis, the Owner and Contractor may agree to adjust the insurance requirements for any particular Subcontractor.

1.2 Before starting the Work, upon renewal of any policy, and upon a change of any insurance carrier, the Contractor must deliver to the Owner certificates from the Contractor evidencing that the required insurance is in force and a copy of all policy endorsements. The Contractor shall provide a subcontractor's certificate of insurance upon the Owner's request.

1.2.1 Certificates of insurance for other than government-controlled workers' compensation insurance must identify **(1)** all below-required additional insureds and **(2)** the Project name.

1.3 With the exception of government-controlled workers' compensation coverage:

1.3.1 the Contractor must place the insurance with companies that **(1)** are satisfactory to the Owner, **(2)** hold an A.M. Best Rating of A-, X, or higher, and **(3)** are authorized to conduct business in the state in which the Project site is located;

1.3.2 the policies must be endorsed to require the insurance carrier to **(1)** provide at least 30-days' written notice to the Owner (as certificate holder) of the cancellation or non-renewal of the insurance and **(2)** provide at least 10-days' written notice to the Owner (as certificate holder) of the cancellation of the insurance for non-payment of premium; and

1.3.3 within 30 days of the Owner's request, the Contractor/Subcontractor must submit insurance-company certified copies of the policies, the policy endorsements, loss-run reports, or all three.

1.4 Within three business days after the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor must provide notice to the Owner of the impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner may stop the Work until the lapse in coverage has been cured by the Contractor's or a Subcontractor's procurement of replacement coverage.

1.5 The Contractor must pay all deductibles, or self-insured retentions, or both contained in the Contractor's or a Subcontractor's insurance policies required or provided in connection with the Project. The Owner reserves the right to approve or reject all levels of self-insured retention, captive insurance programs, or other alternative risk financing the Contractor may use to comply with any insurance requirement.

1.6 The Contractor must pay a proportionate share of the deductibles, or self-insured retentions, or both contained in any insurance policy the Owner purchases for the Project. The Contractor's proportionate share will derive from the percentage of the associated claim or loss attributable to the alleged or actual negligence of the Contractor or a Subcontractor.

1.7 If the Contractor or a Subcontractor carries limits higher than those specified or coverage broader than what is specified, these Insurance Requirements will be deemed to require the Contractor or Subcontractor (as applicable) to carry those higher limits and broader coverage.

1.8 The Owner does not represent that required coverage or limits are adequate to protect the Contractor or any Subcontractor.

1.9 Failure of the Owner to demand a certificate or other evidence of full compliance with the insurance requirements or failure of the Owner to identify a deficiency from evidence that is provided must not be construed as a waiver of the Contractor's or a Subcontractor's obligation to maintain the required insurance.

1.10 The Owner may terminate the Contract for cause on account of the Contractor's failure to maintain required insurance or to timely provide required insurance-related information to the Owner.

1.11 The Contractor is responsible for any loss not covered on account of the depletion of a Subcontractor's insurance limits.

Article 2 Minimum Coverage Requirements

2.1 **Workers Compensation – Contractor and Subcontractors.** The Contractor and each Subcontractor must maintain workers' compensation coverage which **(1)** meets the requirements of applicable law; and **(2)** includes, without limitation, the Jones Act and the Longshore & Harbor Workers Compensation Act if Work involves hazards arising from work on or near navigable waterways, including vessels and docks. For the avoidance of doubt, "opting out" of workers' compensation coverage where permitted under applicable law does not satisfy the requirements of this section.

2.2 **Employers Liability Coverage – Contractor.** The Contractor and each Subcontractor must maintain employers' liability coverage with **(1)** an each-accident limit of $1,000,000, **(2)** a disease each-employee limit of $1,000,000, and **(3)** a disease policy limit of $1,000,000.

2.3 **Commercial General Liability – Contractor and Subcontractors.** The Contractor and each Subcontractor must maintain commercial general liability ("CGL") coverage that provides no less than **(1)** an each-occurrence limit of $1,000,000, **(2)** a general-aggregate limit of $2,000,000, and **(3)** a products and completed-operations aggregate limit of not less than $2,000,000.

.1 The CGL insurance must be written on ISO occurrence form CG 00 01 04 13 or a substitute form providing at least equivalent coverage for liability arising from premises, operations, independent contractors, products/completed-operations, personal and advertising injury, and liability assumed under an insured contract.

.2 The CGL policy must include the Owner, Architect, and Project Lender (if any) as additional insureds using ISO endorsement CG 20 10 04 13 and ISO endorsement CG 20 37 04 13 or a substitute form(s) providing equivalent coverage.

.3 The CGL policy must be endorsed using ISO endorsement CG 20 34, blanket additional insured – equipment lessors, or equivalent.

.4 The CGL policy must be endorsed using ISO endorsement CG 24 04 or equivalent to include a blanket waiver of subrogation in favor of the additional insured(s).

.5 The CGL policy must be endorsed using ISO endorsement CG 25 03 or a substitute form providing equivalent coverage to provide that the general aggregate limit applies separately to each of the insured's projects.

.6 The CGL policy must provide that the general aggregate reinstates annually.

.7 The CGL policy must be endorsed using ISO endorsement CG 21 65, hostile fire and HVAC exception to pollution exclusion, or equivalent.

.8 The CGL insurance must not exclude coverage for property damage to electronic data.

.9 The CGL policy must not exclude coverage for residential, apartments, or multi-family projects.

.10 If the Work includes exterior insulation finishing systems (EFIS), the CGL policy must not exclude coverage for EFIS.

.11 The CGL policy must not exclude coverage for explosion, collapse, or underground work.

.12 The CGL policy must not contain ISO endorsements CG 22 94 or CG 22 95 or their equivalents excluding work performed by subcontractors.

.13 The CGL policy must be endorsed to include an amendment of the definition of occurrence to provide coverage for subcontracted work property damage.

.14 The CGL insurance must apply as primary and non-contributory insurance with respect to any other insurance or self-insurance programs that cover the additional insured(s).

.15 The CGL policy must not exclude coverage to the additional insured(s) for bodily injury or property damage arising out of the products/completed-operations hazard.

.16 The Contractor and each Subcontractor (as applicable) must maintain the CGL's completed-operations coverage in effect for five years after the earlier of the termination the Contract or Substantial Completion of all Work.

2.4 **Business Automobile Liability – Contractor.** The Contractor must maintain business automobile ("BA") coverage written on ISO form CA 00 01 10 13 or a substitute form providing at least equivalent coverage with a combined single limit of not less than $1,000,000 each accident.

.1 The coverage must extend to any auto (owned, not owned, leased, rented, hired, or borrowed).

.2 The BA policy must include the Owner, Architect, and Project Lender (if any) as additional insureds.

.3 The BA policy must include an MCS-90 endorsement if transporting hazardous wastes/materials.

.4 The BA policy must provide for a waiver of subrogation for bodily injury and property damage in favor of the additional insureds and every contractor and subcontractor on the Project site.

2.5 **Umbrella/Excess Liability - Contractor.** The Contractor must maintain a "follow form" umbrella/excess liability policy with a limit of not less than $10,000,000 (in addition to the above-required limits). The Contractor may also employ a "follow form" umbrella/excess liability policy to achieve the above-required minimum coverage.

2.6 **Contractor's Pollution Liability – Contractor.** The Contractor must maintain a contractor's pollution liability ("CPL") policy with **(1)** a per-claim limit of not less than $2,000,000 and **(2)** an annual-aggregate limit of not less than $2,000,000, covering the acts, errors and/or omissions of the Contractor or its Subcontractors for damages (including from mold, fungus, bacteria, and Legionella) sustained by the Owner by reason of the Contractor's performance of the Work.

.1 Each CPL policy must have an effective date which is on or before the date that the Contractor or Subcontractor (as applicable) first started to perform any Project-related Work.

.2 The Contractor's CPL policy must provide that the Owner, Architect, and Project Lender (if any) are additional insureds.

.3 Upon submission of the associated certificate of insurance and at each policy renewal, the Contractor or Subcontractor (as applicable) must advise the Owner in writing of any actual or alleged claims that may erode the CPL policy's limits.

.4 Each CPL policy must provide coverage for completed operations and be maintained for no less than five years after the earlier of the termination of the Contract or Substantial Completion of all Work.

2.7 **Professional Liability—Contractor.** If the Work includes the Contractor or a Subcontractor providing professional services requiring a licensed design professional (including without limitation EPC or design-build Work), the Contractor, Subcontractor, or the licensed design professional must maintain contractor's professional liability insurance without design-build exclusions which provides **(1)** an each-claim limit of not less than $1,000,000, and **(2)** an annual-aggregate limit of not less than $2,000,000.

.1 The professional liability policy must have an effective date on or before the date on which the Contractor first started to provide any Project-related services.

.2 Upon submission of the associated certificate of insurance and at each policy renewal, the Contractor must advise the Owner in writing of any actual or alleged claims that may erode the professional liability policy's limits.

.3 The Contractor or licensed design professional must maintain the professional liability insurance in effect for no less than five years after the earlier of the termination of the Contract or Substantial Completion of all Work.

2.8 **Professional Liability—Subcontractors.** Each Subcontractor which provides professional services requiring a licensed design professional (including without limitation EPC or design-build Work such as but not limited to fire suppression, fire alarm, concrete, retaining walls, truss design, or other design-build work) must maintain contractor's professional liability insurance without design-build exclusions which provides **(1)** an each-claim limit of not less than $1,000,000, and **(2)** an annual-aggregate limit of not less than $2,000,000.

.1 The professional liability policy must have an effective date on or before the date that the Subcontractor first started to provide any Project-related services.

.2 Upon submission of the associated certificate of insurance and at each policy renewal, the Contractor must advise the Owner in writing of any actual or alleged claims that may erode the professional liability policy's limits.

.3 The Subcontractor must maintain the professional liability insurance in effect for no less than five years after the earlier of the termination of the Contract or Substantial Completion of all Work.

2.9 **Equipment Coverage – Contractor and Subcontractors.** The Contractor and each Subcontractor is solely responsible for maintaining all insurance necessary to cover its owned, leased, rented, or borrowed tools, equipment, and vehicles. The Owner will not insure or be liable for damage to any Contractor or Subcontractor owned, leased, rented, or borrowed tools, equipment, or vehicles.

2.10 **Aviation Liability – Contractor and Subcontractors.** If the Contractor or a Subcontractor uses aircraft, including helicopters or drones/UAVs, in performance of the Work, the Contractor or Subcontractor (as applicable) must maintain aircraft or aviation liability coverage in an amount of no less than $10,000,000. The Owner will not be liable for any damage to any aircraft owned, leased, rented, or borrowed by the Contractor or Subcontractor.

2.11 **Watercraft Liability – Contractor and Subcontractors.** If the Contractor or a Subcontractor uses watercraft in the performance of the Work, the Contractor or Subcontractor (as applicable) must maintain watercraft liability coverage including protection and indemnity insurance in an amount of no less than $2,000,000. The Owner will not be liable for any damage to any watercraft owned, leased, rented, or borrowed by the Contractor or a Subcontractor.

2.12 **Property Insurance.** If the shipment of equipment or materials for the Work will not be covered by Owner-provided builder's risk insurance (if any), the Contractor must maintain ocean marine or inland marine insurance to the site including cost, insurance, and freight with limits of not less than an amount equal to the full replacement cost of the equipment/materials shipped to final destination point.

PHASE I ENVIRONMENTAL SITE ASSESSMENT
ST. THERESA VILLAGE
6783 SIEBERN AVENUE
SILVERTON, HAMILTON COUNTY, OHIO 45236

D3G PROJECT NUMBER:
2025-001881

REPORT ISSUE DATE:
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INSPECTION DATE:
SEPTEMBER 23, 2025

PREPARED FOR:
NATIONAL CHURCH RESIDENCES
2245 NORTH BANK DRIVE
COLUMBUS, OHIO 43220

Ed Nikolich
Site Assessor

Signature

Dana Pelkey
Environmental Technician

Signature

Alexis Brass
Environmental Professional

Signature

Robert Hazelton
Principal

Signature

DOMINION
DUE DILIGENCE

EXECUTIVE PROPERTY DESCRIPTION

Property: St. Theresa Village
6783 Siebern Avenue
Silverton, Hamilton County, Ohio 45236

Site Description: The subject property consists of one (1) three-story age-restricted apartment structure constructed in 1996. The subject property structure contains a total of fifty (50) age-restricted residential dwelling units and are situated on approximately 2.171 acres of land. The subject property contains a gross building area of approximately 42,192 square feet. Located within the apartment structure are laundry facilities, a leasing office, maintenance areas, a mail kiosk, a wellness center, a community kitchen and dining area, and storage areas. Exterior property improvements include a maintenance shed, landscaped regions, and asphalt parking areas. The subject property is serviced by electricity, natural gas, and municipally supplied water and sewer. The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex.

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1.0 EXECUTIVE SUMMARY

The following table summarizes the conclusions and opinions representing Dominion Due Diligence Group's (D3G's) best professional judgment based on information accessed during the course of this investigation. D3G performed a Phase I Environmental Site Assessment that included subject property observations of the St. Theresa Village on September 23, 2025 located at 6783 Siebern Avenue in Silverton, Hamilton County, Ohio (subject property).

EVALUATED CONDITIONS	SECTION REFERENCE	ACCEPTABLE	RECOMMENDED RESPONSE ACTION
STANDARD ENVIRONMENTAL RECORDS REVIEW	5.1	YES	
UNREGULATED UNDERGROUND STORAGE TANK(S) (UST)	6.3	YES	
PAST INDUSTRIAL/DETRIMENTAL OPERATIONS	5.4 5.5	YES	
VAPOR ENCROACHMENT CONDITION	5.6	YES	
STORED HAZARDOUS MATERIALS	6.3 6.4	YES	
POLYCHLORINATED BIPHENYLS (PCBS)	6.3 6.4	YES	
ABOVEGROUND STORAGE TANK(S) (AST)	6.3 6.4	YES	
DUMPING, LANDFILLS	6.3	YES	
HAZARDOUS RUN-OFF	6.3	YES	
ASBESTOS-CONTAINING MATERIALS	8.1	YES	
LEAD-BASED PAINT	8.2	YES	
RADON GAS	8.3	YES	
FLOOD ZONE	8.4	YES	
WETLANDS	8.5	YES	
MOLD	8.6	YES	
LEAD IN DRINKING WATER	8.7	YES	
OTHER	NA	YES	

D3G has performed a Phase I ESA at the subject property. Based on the conclusions, D3G recommends no further investigation.

2.0 INTRODUCTION

2.1 Purpose

National Church Residences contracted Dominion Due Diligence Group (D3G) to perform a Phase I Environmental Site Assessment (ESA) of the St. Theresa Village located at 6783 Siebern Avenue in Silverton, Hamilton County, Ohio (subject property). As such, National Church Residences is considered the "User" of this report as defined under ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process Designation: E 1527-21 (ASTM E 1527-21). HUD and the Ohio Housing Finance Agency (OHFA) are authorized users of this Phase I ESA.

The purpose of the Phase I ESA is to provide all appropriate inquiry into the previous ownership and uses of the subject property and to identify recognized environmental conditions (RECs), which are (1) the presence of hazardous substances or petroleum products in, on, or at the subject property due to a release to the environment; (2) the likely presence of hazardous substances or petroleum products in, on, or at the subject property due to a release or likely release to the environment; or (3) the presence of hazardous substances or petroleum products in, on, or at the subject property under conditions that pose a material threat of a future release to the environment. In addition, the Phase I ESA includes the identification of controlled recognized environmental conditions (CRECs), historical recognized environmental conditions (HRECs), and de minimis conditions. CRECs are RECs affecting the subject property that has been addressed to the satisfaction of the applicable regulatory authority or authorities with hazardous substances or petroleum products allowed to remain in place subject to implementation of required controls (for example, activity and use limitations or other property use limitations). HRECs involve a previous release of hazardous substances or petroleum products affecting the subject property that has been addressed to the satisfaction of the applicable regulatory authority or authorities and meeting unrestricted use criteria established by the applicable regulatory authority or authorities without subjecting the subject property to any controls (for example, activity and use limitations or other property use limitations). An HREC is not a REC. De minimis conditions generally do not present a threat to human health or the environment and generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. A de minimis condition is not a REC nor a CREC. For the purposes of this reporting, D3G defines "environmental concerns" as de minimis conditions and non-scope considerations for which further action is recommended.

As per the U.S. Housing and Urban Development (HUD) Multifamily Accelerated Processing Guide, as amended, the Phase I ESA provides an initial determination of the overall Department's environmental responsibilities pursuant to 24 CFR 50.3(i). In addition, this report assesses non-scope considerations as directed by the client. Factual information regarding on-site business operations, conditions, and historical data provided to D3G is assumed to be correct and complete.

This investigation was conducted in accordance with ASTM E 1527-21 published guidelines, 40 CFR Part 312, Standards and Practices for All Appropriate Inquiries: Final Rule, U.S. Housing and Urban Development (HUD) Multifamily Accelerated Processing Guide, as amended, OHFA environmental guidelines, and accepted Phase I ESA industry standards.

2.2 Detailed Scope of Services

The ASTM E 1527-21 scope of work for this Phase I ESA consisted of the following:

- site reconnaissance of the subject property and a visual survey of the adjacent properties to evaluate the potential for RECs;
- review of applicable and reasonably ascertainable information about the subject property, including aerial photography, USGS topographic map, state and federal databases, Sanborn maps, property assessment information and other governmental sources that are publicly available, practically reviewable, and obtainable within reasonable time and cost constraints;
- interviews with selected individuals knowledgeable about the subject property and vicinity properties; and
- if provided, a review of existing environmental reports documenting previous assessment and remediation efforts completed at the subject property.

D3G also evaluated the following ASTM Non-Scope Considerations in accordance with the U.S. HUD Multifamily Accelerated Processing (MAP) Guide, as amended, and the OHFA environmental guidelines, including, but not limited to, Tier 1 Vapor Encroachment Screening in general compliance with ASTM Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions Designation: E 2600-22, asbestos-containing materials, lead-based paint, radon gas, flood zone, wetlands, mold, and lead in drinking water. In addition, it should be noted that the HUD Environmental Review Record Related Federal Laws and Authorities Worksheets are included under separate cover.

This Phase I ESA did not include the collection or analysis of soil or groundwater samples.

2.3 Significant Assumptions

Factual information regarding on-site business operations, conditions, and historical data provided to D3G is assumed to be correct and complete. D3G assumes no responsibility for hidden or latent conditions or misrepresentation, or inaccurate information provided, by the property owner, its representatives, public information officials or any authority consulted in connection with the compilation of this report.

D3G assumes that all information provided by Environmental Data Resources, Inc. (EDR) regarding the regulatory status of facilities within the approximate minimum search distance is complete, accurate and current.

D3G assumes no responsibility for differing opinions or interpretations by client or governmental or regulatory agencies of controlling laws, standards, or regulations provided D3G's services were performed in a professional manner.

2.4 Limitations and Exceptions

D3G encountered the following limitations, exceptions, and/or data gaps during the performance of this Phase I ESA:

- Our on-site observations pertain only to specific locations at specific times on specific dates. This report and conclusions herein are based upon data collection between September 10, 2025 and October 22, 2025. Our observations and conclusions do not reflect variations in conditions that may exist, in unexplored areas of the site, or at times other than those represented by our observations.
- In order for the prospective purchaser to claim protection from CERCLA liability as an innocent landowner, bona fide prospective purchaser, or contiguous property owner, the acquisition of the subject property should be completed within 180 days after the subject property inspection date.
- Accordingly, the professional services rendered by D3G are valid for a period of 180 days.
- According to 40 CFR Part 312, Standards and Practices for All Appropriate Inquiries: Final Rule, CERCLA liability rests with the owner or operator of a property and not with an environmental professional hired by the prospective landowner and who is not involved with the ownership or operation of the property.
- This report meets the requirements set forth in 40 CFR Part 312 Standards and Practices for All Appropriate Inquiries: Final Rule. However, in order to qualify for certain landowner liability protections under CERCLA, Bona Fide Prospective Purchasers, Contiguous Property Owners, and/or Innocent Landowners must meet additional requirements in 101(35)(B) of CERCLA (42 U.S.C. 9601(35)) of the Federal Register.
- No significant data gaps in historical information were identified that would impact D3G's ability to identify RECs. Collectively the sources considered and consulted during the course of this assessment allowed D3G to adequately determine the subject property history. Therefore, these data gaps are not considered to be significant.
- Historical information was not reasonably ascertainable prior to 1937; however, this did not affect the conclusions in this report because the subject property was vacant in 1938. Therefore, this limitation is not significant.
- D3G was unable to gain access to the on-site maintenance shed. However, according to Mr. Robert Anderson, Maintenance Supervisor, the shed is used to for snowblower garage with deicing salt and cans. Based on the use of the room, this limitation is not considered to be significant.

2.5 Special Terms and Conditions

This investigation was conducted in accordance with ASTM E 1527-21 published guidelines and 40 CFR Part 312, Standards and Practices for All Appropriate Inquiries: Final Rule. In addition, Non-Scope items are addressed in accordance with the U.S. HUD Multifamily Accelerated Processing (MAP) Guide, as amended and OHFA environmental guidelines.

2.6 User Reliance

This report has been prepared for, and can be relied upon by the Client, National Church Residences , the United States Department of Housing and Urban Development (HUD), and the Ohio Housing Finance Agency (OHFA). This report is not to be relied upon or reproduced, either in whole or in part, without written consent from D3G.

3.0 SUBJECT PROPERTY DESCRIPTION

3.1 Location and Legal Description

The subject property is located at 6783 Siebern Avenue in Silverton, Hamilton County, Ohio and contains a total of approximately 2.171 acres of land. The subject property is situated at an elevation of approximately 840 feet above mean sea level and is located at Latitude, 39.193256 and Longitude, -84.408971.

MUNICIPAL PARCEL IDENTIFIER	MUNICIPAL PARCEL NUMBER
PARCEL ID NUMBER	602-0001-0059-00

SOURCE - Hamilton County assessment documents

A copy of the tax card and a map illustrating the legal property boundary is included in Appendix A of this report.

3.2 Site and Vicinity General Characteristics

The subject property is located in an area of residential and light commercial development, and undeveloped land.

3.3 Current Use of the Subject Property

The subject property is currently utilized as an age-restricted apartment complex.

3.4 Description of Structures, Roads, and Other Improvements

The following section describes general conditions and features as noted during D3G's inspection:

GENERAL SUBJECT PROPERTY DESCRIPTION AND IMPROVEMENTS	
SUBJECT PROPERTY ACREAGE	Approximately 2.171 acres
BUILDING(S) DESCRIPTION	One (1) three-story age-restricted apartment building
ADJOINING ROADS	Belkenton Avenue, Siebern Avenue, and Placid Place
CONSTRUCTION DATE(S)	1996
EXTERIOR IMPROVEMENTS	A maintenance shed, landscaped regions, and asphalt parking areas
UNIMPROVED AREAS	NA

D3G was provided an Architectural Site Plan prepared by Berardi Partners dated September 16 2025, which depicts the subject property boundaries, structures and improvements, and general vicinity characteristics. A copy of the Architectural Site Plan is included in Appendix B.

3.4.1 Subject Property Utilities

SUBJECT PROPERTY UTILITIES	
ELECTRICITY	Duke Energy
NATURAL GAS	Duke Energy
WATER	Cincinnati Water Works
SANITARY SEWER	Cincinnati Water Works
INDUSTRIAL WASTEWATER	NA
SOLID WASTE	Republic Waste

HEATING SOURCE	AGE
Natural Gas	1996- Current

COOLING SOURCE	AGE
Electricity	1996 - Current

Potable hot water to the dwelling units and common areas is supplied by central gas-fired commercial water heaters located in a first floor mechanical room. The dwelling units are provided heated and conditioned air via thru-wall Packaged Terminal Air Conditioner (PTAC) units. The common areas are provided HVAC via roof-top packaged units, as well as additional PTAC units.

3.5 Current Uses of Adjoining Properties

DIRECTION	LAND USAGE
NORTH	Multi-family residential and undeveloped wooded land
EAST	Sierbern Avenue and single-family residential
SOUTH	Placid Drive and single-family residential
WEST	Belkenton Avenue and vacant, former St. Theresa Care Center

See Appendix B for a copy of the Site Plan, which identifies subject property structure(s) and general vicinity characteristics.

4.0 USER PROVIDED INFORMATION

4.1 Title Records

PARCEL IDENTIFICATION	OWNER	PURCHASE DATE	CONVEYANCE #
602-0001-0059-00	St. Theresa Village Inc	December 13, 1995	15421

SOURCE - Hamilton County assessment documents

Due to the nature of the tax assessment documents and deed records, a thorough chain-of-title was not reasonably ascertainable.

4.2 Environmental Liens or Activity and Use Limitations (AULs)

It is the User's responsibility to provide D3G with information pertaining to environmental liens or AULs. According to information provided in the completed User Questionnaire, there are no environmental liens or AULs associated with the subject property.

4.3 Specialized Knowledge

According to the completed User Questionnaire, the Prospective Landowner Representative did not indicate to D3G that they were aware of any specialized knowledge or experience that is material to recognized environmental conditions in connection with the subject property. The Prospective Landowner Representative was unaware of any environmental liens or activity use limitations (AULs) encumbering the property or in connection with the subject property.

4.4 Commonly Known or Reasonably Ascertainable Information

The Prospective Landowner Representative did not indicate to D3G, in the completed User Questionnaire, that they were aware of commonly known or reasonably ascertainable information within the local community about the property that is material to recognized environmental conditions in connection with the property.

4.5 Valuation Reduction for Environmental Issues

According to Mr. Timothy Westrich, Senior Project Leader with National Church Residences and the Prospective Landowner Representative, the purchase price being paid reasonably reflects the fair market value for the subject property.

4.6 Owner, Property Manager, and Occupant Information

The subject property is currently owned by St. Theresa Village Inc and the Current Landowner questionnaire is discussed further in Section 7.2. The current Key Site Manager and the questionnaire is discussed further in Section 7.4.

4.7 Reason For Performing Phase I ESA

The user informed D3G that the Phase I ESA is being performed because the Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex.

4.8 Previous Environmental Reports

A previous Phase I ESA report produced by AEI dated May 17, 2024, was provided to D3G for review. AEI concluded that there were no recognized environmental conditions (RECs) associated with the subject property.

5.0 RECORDS REVIEW

5.1 Standard Environmental Records Sources

5.1.1 State Regulatory Records

DATABASE	SEARCH DISTANCE
STATE AND TRIBAL LEAKING STORAGE TANK DATA (LUST/LAST)	0.50 Mile
STATE AND TRIBAL STORAGE TANK DATA (UST/AST)	0.25 Mile
STATE AND TRIBAL VOLUNTARY CLEANUP PROGRAM SITES (VCP)	0.50 Mile
STATE AND TRIBAL BROWNFIELD SITES (BROWNFIELDS)	0.50 Mile
STATE AND TRIBAL HAZARDOUS WASTE SITES (SHWS)	1.00 Mile
STATE AND TRIBAL INSTITUTIONAL/ENGINEERING CONTROLS (IC/EC)	0.125 Mile
STATE AND TRIBAL REGISTERED SOLID WASTE LANDFILLS (SWL)	0.75 Mile

SOURCE - State of Ohio governmental records accessed by Environmental Data Resources Inc. (EDR)

The LUST incidents and BROWNFIELDS, DERR, and UST facilities are not located on-site or adjacent and are not of environmental concern to the subject property. The closest record is located approximately 0.141 miles south and presumed hydrogeologically cross-gradient from the subject property. Based on the listed distances, presumed hydrogeologic relationships, and/or current regulatory statuses, the vicinity state-regulated facilities are not suspected to present environmental concerns to the subject property.

Please note that D3G additionally performed a Tier 1 Vapor Encroachment Screen (VES) in compliance with ASTM E 2600-22 "ASTM Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions" as amended, which is discussed in further detail in Section 5.6 and supported by the Non-Invasive Tier 1 VES located in Appendix E. Regulatory database listings that require further evaluation are discussed as necessary.

5.1.2 Federal Regulatory Records

DATABASE	SEARCH DISTANCE
EPA NATIONAL PRIORITIES LISTING (NPL - SUPERFUND)	1.00 Mile
EPA NATIONAL PRIORITIES LISTING (NPL - DELISTED SITES)	0.50 Mile
EPA SUPERFUND ENTERPRISE MANAGEMENT SYSTEM (SEMS)	0.50 Mile
EPA SEMS ARCHIVED SITES (SEMS-ARCHIVE)	0.50 Mile
EPA RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)	0.25 Mile
EPA RCRA TREATMENT, STORAGE, AND DISPOSAL (TSD)	0.50 Mile
FEDERAL INSTITUTIONAL/ENGINEERING CONTROLS (IC/EC)	0.125 Mile
EPA EMERGENCY RESPONSE NOTIFICATION-SITES (ERNS)	0.15 Mile
EPA RCRA CORRECTIVE ACTION REPORT (CORRACTS)	1.00 Mile

SOURCE - Environmental Protection Agency records accessed by Environmental Data Resources (EDR)

The US BROWNFIELDS and SEMS facilities are not located on-site or adjacent and are not of environmental concern to the subject property. The closest record is located approximately 0.399 miles east and presumed hydrogeologically up- and cross-gradient from the subject property. Based on the listed distances, presumed hydrogeologic relationship, and/or current regulatory status, the vicinity federally-regulated facilities are not suspected to present environmental concerns to the subject property.

Please note that D3G additionally performed a Tier 1 Vapor Encroachment Screen (VES) in compliance with ASTM E 2600-22 "ASTM Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions" as amended, which is discussed in further detail in Section 5.6 and supported by the Non-Invasive Tier 1 VES located in Appendix E. Regulatory database listings that require further evaluation are discussed as necessary.

5.1.3 Non-Geocoded Sites

No non-geocoded sites were determined to be located within the applicable search radius for ASTM E 1527-21.

5.2 Additional Environmental Record Sources

Five (5) additional environmental records were identified in the EDR Report. The additional environmental records were not located on-site or adjacent and are not of environmental concern to the subject property. Based on the listed distances, presumed hydrogeologic relationships, and/or current regulatory statuses, the vicinity additional environmental records are not suspected to present environmental concerns to the subject property.

5.3 Physical Setting Sources

5.3.1 Topography and Regional Surface Water

TOPOGRAPHY AND REGIONAL SURFACE WATER	
ELEVATION (feet above mean sea level)	Approximately 840 Feet
SLOPE	Relatively flat
APPROXIMATE GROUNDWATER FLOW	Northwest
REGIONAL SURFACE WATER	An intermittent tributary of Mill Creek is located approximately 0.03 miles northwest of the subject property and flows west northwest. Various other intermittent tributaries of Mill Creek are located between the subject property and Mill Creek. Mill Creek is located approximately 2.73 miles northwest of the subject property and flows south southwest into the Ohio River.

SOURCE - USGS Topographic Quadrangle - East Cincinatti, Ohio 2023

Located in Appendix A is a topographic map depicting subject property elevations and drainage patterns. Depth to groundwater fluctuates depending on hydrological and weather conditions.

On-site drainage at the subject property is suspected to consist of flow along the asphalt parking areas to strategically located storm drains and surface percolation in the unpaved areas.

5.3.2 Soil Characteristics

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, accessed at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, the subject property consists of one (1) soil type: Urban land-Alfic Udrents complex, fragipan substratum over till, 0 to 12 percent slopes (UfAXC). This soil type does not meet hydric criteria. Urban land consists of nearly level to moderately sloping areas where more than 85 percent of the surface is covered by asphalt, concrete, buildings, or other impervious surfaces. Further detail about the soil type is included in Appendix A.

5.4 Historical Use Information on the Subject Property

5.4.1 Review of Aerial Photographs

D3G reviewed aerial photographs from 1938, 1949, 1951, 1956, 1960, 1964, 1970, 1985, 1988, 1994, 2001, 2006, 2011, 2015, 2019, 2023, and 2025. It should be noted that the subject property is not depicted in the 1964 aerial. According to the reviewed information, the subject property was originally depicted as undeveloped wooded and grassland with a circular garden path associated with the vacant, former St. Theresa Care Center, prior to conversion to the existing land use as an age-restricted apartment structure. No environmental concerns were identified on the subject property based upon a review of the aerial photography.

A copy of the aerial photography is included in Appendix D of this report.

5.4.2 Fire Insurance Maps

D3G reviewed Sanborn Fire Insurance Maps from 1922, 1937, 1950, and 1981. It should be noted that the subject property is not depicted in the 1922 Sanborn. According to the reviewed information, the subject property is depicted as vacant land and a private drive. No environmental concerns were identified on the subject property based upon a review of the Sanborn Fire Insurance Maps.

A copy of the Certified Sanborn Map Report is included in Appendix D.

5.4.3 Local Street Directories

Based on the reviewed historical information outlined in Sections 5.4.1 and 5.4.2, the EP has determined that a review of historical local street directories will not provide any additional insight into the historic usage of the subject property. Therefore, a historical local street directories records review was not conducted.

5.4.4 Historical Topographic Maps

Based on the reviewed historical information outlined in Sections 5.4.1 and 5.4.2, the EP has determined that a review of historical topographic maps will not provide any additional insight into the historic usage of the subject property. Therefore, a historical topographic maps records review was not conducted.

5.4.5 Other Historical Sources

No additional historical sources were reasonably ascertainable.

5.4.6 Summary of Subject Property History

According to the reviewed subject property historical information, the subject property consisted of vacant land and a private drive in 1937, undeveloped wooded and grassland with a garden path associated with the western adjacent vacant, former St. Theresa's Care Home from at least 1938 until construction of the current subject property structure in 1996.

5.5 Historical Use Information on Adjoining Properties

5.5.1 Review of Aerial Photographs

D3G reviewed aerial photographs from 1938, 1949, 1951, 1956, 1960, 1964, 1970, 1975, 1985, 1988, 1994, 2001, 2006, 2011, 2015, 2019, 2023, and 2025. According to the reviewed information, the adjacent properties have consisted of undeveloped and/or wooded land, residential properties, and/or commercial properties. No environmental concerns were identified on the adjacent properties based upon a review of the aerial photography.

A copy of the aerial photography is included in Appendix D of this report.

5.5.2 Fire Insurance Maps

D3G reviewed Sanborn Fire Insurance Maps from 1922, 1937, 1950, and 1981. According to the reviewed information, the adjacent properties are first depicted on the Sanborn Map 1937 and have consisted of vacant land, residential properties, and St. Theresa R.C. Home for the Aged. No environmental concerns were identified on the adjacent properties based upon a review of the Sanborn Fire Insurance Maps, except for the following:

A gasoline tank is depicted adjacent to the west and presumed hydrogeologically down-gradient from the subject property at the St. Theresa R.C. Home for the Aged in the 1937 and 1950 Sanborn maps. The gasoline tank is no longer depicted in the 1981 Sanborn map; therefore, D3G presumes the gasoline tank was removed. Based on the presumed removal of the gasoline tank, likely natural attenuation of any residual contamination, and the presumed hydrogeological relationship, the former adjacent gasoline tank is not suspected to present an environmental concern to the subject property. The facility is discussed further in Section 5.6.

A copy of the Certified Sanborn Map Report is included in Appendix D.

5.5.3 Local Street Directories

Based on the reviewed historical information outlined in Sections 5.5.1 and 5.5.2, the EP has determined that a review of historical local street directories will not provide any additional insight into the historic usage of the adjoining properties. Therefore, a historical local street directories records review was not conducted.

5.5.4 Historical Topographic Maps

Based on the reviewed historical information outlined in Sections 5.5.1 and 5.5.2, the EP has determined that a review of historical topographic maps will not provide any additional insight into the historic usage of the adjoining properties. Therefore, a historical topographic maps records review was not conducted.

5.5.5 Other Historical Sources

No additional historical sources were reasonably ascertainable.

5.6 Tier 1 Vapor Encroachment Screening

D3G performed a Tier 1 Vapor Encroachment Screen (VES) in compliance with ASTM E 2600-22 "ASTM Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions" as amended. The purpose of the Tier 1 VES is to conduct an initial screen to determine if a Vapor Encroachment Condition (VEC) exists in connection with the subject property. A VEC is defined as the presence or likely presence of chemical(s) of concern (COC) vapors in the subsurface (vadose zone) of the subject property caused by the release of vapors from contaminated soil and/or groundwater either on or near the subject property, as identified by Tier I and/or Tier II procedures.

The VES process is a two (2)-tiered screening process. The Tier 1 VES is based upon information typically collected during an ASTM Standard E 1527 Phase I ESA and is typically focused on known or suspected contaminated properties that may exist within the area of concern (AOC). D3G reviewed standard environmental record sources including, but not limited to, local, state, tribal and/or federal (LSTF) government records, as reported in the regulatory database report; chemical use and historical records of prior uses on the subject property and within proximity of the subject property; soil characteristics; geological characteristics; contaminant characteristics and plume migration data (if this data is readily available); significant conduits that that might provide preferential pathways for vapor migration; and groundwater depth and groundwater flow data to identify known or suspected sources of contamination within the AOC.

According to ASTM E 2600-22, the AOC is defined by the approximate minimum search distance which is based upon the chemical of concern (i.e. petroleum hydrocarbons vs. non-petroleum hydrocarbons) and the location of a known or suspected source of contamination with respect to the subject property. The Tier 1 screening includes: (1) a search distance test to determine whether there are any known or suspect contaminated properties within the AOC; and (2) COC Test to determine for those known or suspect contaminated properties within the AOC whether COCs are likely to be present in order to evaluate the likelihood that a VEC exists at the subject property. If information related to the boundaries of a contaminant plume from known contaminated properties is available, a critical distance test may be conducted. The critical distance is defined as the lineal distance between the nearest edge of the contaminant plume and the nearest subject property boundary. The critical distance is equal to one hundred (100) feet for COC or thirty (30) feet for dissolved petroleum hydrocarbon COCs. The critical distance for petroleum hydrocarbon COCs as light non-aqueous phase liquid (LNAPL), such as gasoline product(s), is one hundred (100) feet. If groundwater flow direction can be estimated, the AOC in the down-gradient direction may be reduced to the area within the critical distance during the Tier 1 screening. Additionally, the cross-gradient direction may be reduced to the critical distance plus one half of a reasonable estimation of the contaminated plume width or three hundred sixty-five (365) feet. It is not necessary to obtain information regarding the contaminant plume dimensions for down-gradient and cross-gradient contaminated properties, as the critical distance is measured from the nearest subject property boundary directly to the source on the off-site down-gradient property that is the origin of the contamination (with the contamination migrating away from the subject property).

For a contaminated property located up-gradient of the subject property, the critical distance determination requires knowledge of the length and depth of the groundwater contaminant plume. Such information is required to determine the lineal distance from the groundwater contaminant plume edge to the nearest existing or planned structure on the subject property, or the nearest subject property boundary if there are no existing or planned structures on the subject property. Data related to contaminant plume characteristics and dimensions associated with off-site contaminated properties is not typically available during the Tier 1 screening process and is typically obtained during the Tier 2 screening process. If it is not

possible to conservatively estimate contaminant plume dimensions, then the AOC cannot be reduced in up-gradient directions during the Tier 1 screening process. Data regarding site-specific soil characteristics may also be used to adjust the AOC. Low permeability cohesive soils, such as soils high in clay and/or silt percentage content, generally tends to restrict soil gas movement, as may soil with high moisture content. Conversely, high porosity in soil tends to enhance soil gas movement. If known, this data may be utilized as a basis to either expand or reduce the AOC by the environmental professional.

The conclusions from the Tier 1 screening is: (1) a VEC exists or (2) a VEC does not exist. If a VEC does not exist, then the VES process is considered complete in accordance with the guidelines set forth under ASTM Standard E 2600-22. If a VEC exists at the subject property, the environmental professional should determine if the VEC represents a Recognized Environmental Condition (REC). If the VEC represents a REC, then further action or investigation may be recommended, including but not limited to a Tier 2 (invasive and/or non-invasive) screening and/or mitigation. If a VEC exists as determined by the Tier 1 screening process, then a more refined Tier 2 VES (non-invasive) may be completed in order to further evaluate the VEC. Tier 2 (non-invasive) focuses on characteristics of the contaminant plume associated with contaminated properties and the proximity of said contaminant plume to the subject property. This data is not typically available during the Tier 1 screening process and is typically obtained from state regulatory files and may also be obtained from other available documents and/or may be collected via sampling. Tier 2 (invasive) applies numeric screening criteria to existing or newly collected soil, soil gas, and/or groundwater testing results to further evaluate and/or validate the potential VEC.

5.6.1 Subject Property VEC Evaluation

Based on a review of the EDR Report, the subject property is not identified in the State Records Search or in the Federal Records Search. In addition, according to a review of subject property historical use information that is reasonably ascertainable, there are no known or suspect potentially contaminated sources having chemicals of concern (petroleum hydrocarbons or non-petroleum hydrocarbons) associated with the subject property. Therefore, a Vapor Encroachment Condition (VEC) does not exist at the subject property.

5.6.2 Contaminated Properties within the Area of Concern

The following is a discussion of properties that are within the area of concern:

A gasoline tank is depicted adjacent to the west and presumed hydrogeologically down-gradient from the subject property at the St. Theresa R.C. Home for the Aged in the 1937 and 1950 Sanborn maps. The gasoline tank is no longer depicted in the 1981 Sanborn map; therefore, D3G presumes the gasoline tank was removed. Based on the presumed removal of the gasoline tank, likely natural attenuation of any residual contamination, and the presumed hydrogeological relationship, the former adjacent gasoline tank is not suspected to present an environmental concern to the subject property. Therefore, a Vapor Encroachment Condition (VEC) does not exist at the subject property from the off-site source.

6.0 SITE RECONNAISSANCE

6.1 Methodology and Limiting Conditions

D3G's site inspection consisted of visual observations along boundaries and various transects throughout the subject property. On the interior, common areas such as lobbies, hallways, utility rooms, recreation areas, maintenance and repair areas, and a representative sample of occupant spaces were observed. The adjacent properties were observed from the subject property and the boundaries of the subject property and public right-of-ways.

6.2 General Site Setting

The subject property consists of one (1) three-story age-restricted apartment structure constructed in 1996. The subject property structure contains a total of fifty (50) age-restricted residential dwelling units and are situated on approximately 2.171 acres of land. The subject property contains a gross building area of approximately 42,192 square feet. Located within the apartment structure are laundry facilities, a leasing office, maintenance areas, a mail kiosk, a wellness center, a community kitchen and dining area, and storage areas. Exterior property improvements include a maintenance shed, landscaped regions, and asphalt parking areas. The subject property is serviced by electricity, natural gas, and municipally supplied water and sewer. The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex.

6.3 Exterior Observations

6.3.1 Hazardous Materials and Petroleum Products

No bulk storage of hazardous materials or petroleum products were identified at the subject property.

6.3.2 Polychlorinated Biphenyls (PCBs)

Located at an exterior location of the property is one (1) pad-mounted electrical transformer, which is owned and maintained by Duke Energy. The on-site electrical transformers were affixed with "Non-PCB" stickers. In addition, leakage was not visually observed on or around the transformers and in their current physical condition they are not believed to present environmental concerns to the subject property.

6.3.3 Subject Property Dumped Materials/Landfills

No dumped debris was observed on-site during the subject property inspection.

6.3.4 Solid Waste Disposal

Located in designated areas of the property is one (1) solid waste dumpster. No staining and/or visual signs of spillage were observed in the vicinity of the dumpster during the subject property visit.

6.3.5 Spills/Stained Soils/Stained Pavement/Stressed Vegetation

Spills, stained soil and/or pavement, and stressed vegetation were not observed on-site during the subject property inspection.

6.3.6 Storage Tanks Not Previously Listed

No additional storage tanks were observed on-site or adjacent to the subject property during the subject property inspection.

6.3.7 Wells Not Previously Listed

Wells were not observed on-site during the subject property inspection.

6.3.8 Hazardous Runoff

Hazardous runoff was not observed on-site during the subject property inspection.

6.3.9 Pits, Ponds, or Lagoons

Pits, ponds, and lagoons were not observed on-site during the subject property inspection.

6.3.10 Odors

Evidence of adverse or suspicious odors was not detected during the subject property inspection.

6.4 Interior Observations

6.4.1 Hazardous Materials and Petroleum Products

No bulk storage of hazardous materials or petroleum products was identified at the subject property. However, paints and cleaning products are stored in the maintenance areas. None of the stored materials were observed to be leaking or to have had signs of major spillage. No floor drains or other potential receptors for the release of hazardous materials were observed within the areas of material storage. The on-site chemicals are commercially available, stored in limited quantities, and are not believed to present an environmental concern to the subject property.

6.4.2 Polychlorinated Biphenyls (PCBs)

One (1) hydraulic elevator is located on the subject property. It is not known whether the hydraulic elevator equipment contains regulated levels of PCBs; however, based on the facility's date of construction (1996), the elevator equipment is not suspected to contain regulated levels of PCBs. In addition, leakage was not observed at the time of the site visit. Therefore, the elevator and the associated equipment are not believed to present environmental concerns to the subject property.

6.4.3 Storage Tanks Not Previously Listed

No additional storage tanks were observed on-site during the subject property inspection.

6.4.4 Odors

Evidence of adverse or suspicious odors was not detected during the subject property inspection.

6.4.5 Drains and/or Sumps

Drains and/or sumps were not observed during the subject property inspection.

6.4.6 Pools of Liquid

Pools of liquid were not observed during the subject property inspection.

7.0 INTERVIEWS

7.1 Prospective Landowner/User Questionnaire

A Property Questionnaire was completed by Mr. Timothy Westrich, Senior Project Leader with National Church Residences and the Prospective Landowner/User, and returned to D3G. Mr. Westrich indicated that the subject property is currently being purchased and sold and that the purchase price being paid reasonably reflects the fair market value. Additionally, Mr. Westrich indicated that a title search has been performed at the subject property; however, a copy was not provided for D3G's review. Mr. Westrich has been associated with the subject property for one (1) year. A copy of the completed Property Questionnaire is included in Appendix F.

7.2 Current Landowner Questionnaire

A Property Questionnaire was completed by Mr. Kassidi Boening, Vice President and the Current Landowner Representative, and returned to D3G. Mr. Boening indicated that subject property was purchased in 2012 and that he has been associated with the property for thirteen (13) years. A copy of the completed Property Questionnaire is included in Appendix F.

7.3 Previous Landowner Questionnaire

The current landowner has owned the property for more than two (2) years; therefore, a previous landowner questionnaire is not required.

7.4 Key Site Manager Questionnaire

A Property Questionnaire was completed by Ms. Tina Keller, with National Church Residences and the Key Site Manager, and returned to D3G. Ms. Keller indicated that she has specialized knowledge or experience related to the subject property and/or nearby properties and that she is aware of the past use(s) of the subject property; however, she did not specify. Additionally, Ms. Keller indicated that she has been associated with the subject property for less than one (1) year. A copy of the completed Property Questionnaire is included in Appendix F.

7.5 Occupant Questionnaire

The subject property is currently utilized for residential purposes; therefore, an Occupant Questionnaire is not necessary for this investigation pursuant to ASTM E1527-21 Section 10.5.2.1.

7.6 Local Agencies Contacted

D3G contacted the City of Hamilton Fire Department on September 11, 2025, for a review of their environmental records (i.e. USTs, hazardous materials storage, and spills) for the subject property. As of the date of this report, D3G has not received a response to this inquiry. Upon receipt of the agency response, D3G will forward this information as an addendum to this report. If no response is received or no material information is identified, our report will not be modified. A copy of the correspondence is located in Appendix F of this report.

D3G contacted Ohio's Bureau of Underground Storage Tank Regulations on October 7, 2025, for a review of their environmental records (i.e. USTs, hazardous materials storage, and spills) for the subject property. As of the date of this report, D3G has not received a response to this inquiry. Upon receipt of the agency response, D3G will forward this information as an addendum to this report. If no response is received or no material information is identified, our report will not be modified. A copy of the correspondence is located in Appendix F of this report.

D3G contacted the Hamilton County Health Department on September 11, 2025, for a review of their environmental records including regional environmental health issues, on-site wells and/or septic system records for the subject property. As of the date of this report, D3G has not received a response to this inquiry. Upon receipt of the agency response, D3G will forward this information as an addendum to this report. If no response is received or no material information is identified, our report will not be modified. A copy of the correspondence is located in Appendix F of this report.

7.7 Additional Persons Interviewed

INTERVIEWED PERSON	POSITION/ RELATION TO PROPERTY	INTERVIEW DATE	CONTENT OF DISCUSSION
Robert Anderson	Maintenance Supervisor	September 23, 2025	Provided tour of facility and discussed operations and maintenance

8.0 INVESTIGATION FOR NON-SCOPE CONSIDERATIONS

8.1 Asbestos-Containing Materials

According to HUD guidelines, buildings constructed prior to 1989 must be inspected by a qualified asbestos inspector. The facility was constructed in 1996; therefore, an asbestos inspection is not required for HUD compliance purposes. However, compliance with 40 CFR 61 Subpart M and State of Ohio asbestos regulations prior to any renovation or demolition activities at the subject property. In addition, according to HUD guidelines, buildings built in 1989 or later must provide knowledge of asbestos use at the property and to verify the composition of roofing materials. According to Mr. Kassidi Boening, Vice President and the Current Landowner Representative, he is not aware of any asbestos-containing materials (ACMs) at the subject property. According to D3G's Capital Needs Assessment (CNA), roofing assemblies consist of pitched roof assemblies constructed of conventional wood framing surfaced with structural wood sheathing, felt paper, and asphalt shingles, along with a smaller flat roof assembly supported by open web wood joists with structural wood sheathing, and a mechanically fastened rubber membrane. The roofing assembly has the potential to contain asbestos; therefore, sampling of the roofing materials is recommended prior to future roof replacement activities.

The facility is proposed for renovation. Therefore, D3G contracted Environmental Concerns, Inc. to perform a pre-renovation asbestos survey at the subject property. Mr. Pete Gibson, a State of Ohio licensed Asbestos Hazard Evaluation Specialist (license #ES35718) with Environmental Concerns, Inc., performed a comprehensive pre-renovation asbestos survey of the subject property structure on September 22, 2025 on behalf of D3G. The inspection and sampling activities were conducted in accordance with the EPA National Emissions Standards for Hazardous Air Pollutants (NESHAP) 40 CFR 763 Subpart M, the ASTM Standard Practice for Comprehensive Asbestos Building Surveys Designation: E 2356-18 (ASTM E 2356-18) for Baseline Surveys and State of Ohio asbestos regulations. Sampled materials included drywall, joint compound, vinyl flooring and covebase materials and associated mastics, sink undercoating materials, interior and exterior caulking materials, and roofing materials. Samples were initially analyzed via Polarized Light Microscopy (PLM) via EPA Method 600/M4â82â020. In addition, in accordance with the analytical requirements of the ASTM E 2356â18 standard, the laboratory analyzed via Transmission Electron Microscopy (TEM) one of each non-friable organically bound (NOB) material (i.e. caulking materials, roofing materials, vinyl flooring and covebase materials, mastics and sink undercoating materials) which was not identified as an ACM via PLM analysis. A total of forty-nine (49) multi-layered samples were collected and analyzed via PLM and twelve (12) samples of NOB materials were re-analyzed via TEM. An ACM is defined as containing greater than 1% asbestos. None of the sampled materials were identified as ACMs.

The Asbestos Inspection Report is included in Appendix J.

If suspect ACMs are encountered during renovation activities which have not been previously sampled, they should be sampled by an appropriately licensed asbestos inspector prior to impaction.

8.2 Lead-Based Paint

The facility was constructed in 1996, after the 1978 ban on lead-based paint (LBP); therefore, LBP is not suspected to be present at the subject property.

8.3 Radon Gas

The subject property is located in an EPA Radon Zone 1, designated as an area of high radon gas potential with an average indoor radon level above 4 picocuries per liter (pCi/L) of air. Mr. Shad Evans, an AARST/NRPP certified radon technician (certification #107790-RMP) and State of Ohio licensed Radon Mitigation Specialist (license #RS157) with Protect Environmental, conducted short-term radon gas testing at the subject property on behalf of D3G from September 26-29, 2025. In accordance with HUD guidelines, testing was conducted in accordance with the ANSI/AARST MA-MFLB-2023, Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial and Mixed-Use Buildings 100% of the ground floor units and common areas. In addition, at least 10% of the units on each of the upper-level floors were tested. At least one (1) activated charcoal testing device was placed in each of the tested units for an undisturbed testing period of 48 to 72 hours. QA/QC samples (field blanks and duplicates) were also submitted in accordance with AARST guidelines. The tenants were requested to maintain closed-building conditions for twelve (12) hours prior to and during the testing. Closed building conditions appeared to have been maintained.

At the end of the recorded sampling period, the testing devices were collected and logged onto chain of custody forms and then submitted to an AARST/NRPP certified and State of Ohio licensed radon analytical laboratory, Air Chek, Inc. (certification/license #101138AL and RL10, respectively). Testing devices were analyzed via the EPA Method #402-R-92-004. Achieved results were compared to the EPA radon action limit of 4.0 pCi/L of air. Samples collected within the facility determined that radon levels were below the EPA action level within the sampled areas during the sampling episode. The results ranged from < 0.3 pCi/L to 2.3 pCi/L. Therefore, no further action is required at this time regarding radon gas.

A copy of the Radon Gas Inspection Report, which details all sampling results, is included in Appendix K.

8.4 Flood Zone

According to FEMA Flood Insurance Rate Map (FIRM) #39061C-0233E dated February 17, 2010, the subject property is located in Unshaded Zone X, designated as an area outside the 100 and 500-year flood zones and the flood potential for the subject property is minimal. According to the FEMA Flood Map Service Center accessed at https://msc.fema.gov/portal/home, there are no preliminary or pending FIRMs for the subject property.

A copy of the FIRM is provided in Appendix A.

8.5 Wetlands

A wetland delineation/determination has not been performed at the subject property; however, according to the USFWS National Wetlands Inventory accessed at https://www.fws.gov/wetlands/data/mapper.html and visual observations, no wetlands are depicted on-site.

A copy of the NWI Map Layer is provided in Appendix A.

8.6 Mold

The subject property was inspected for the visual and olfactory presence of moisture intrusion and mold growth during the site inspection on September 23, 2025. Interior evidence of moisture intrusion or mold growth was not observed during D3G's inspection. In addition, an inspection of exterior areas of the property did not identify evidence of standing water or improper site drainage characteristics.

8.7 Lead in Drinking Water

According to the Annual Water Quality Report - Reporting Year 2024, presented by Hamilton Public Water System, lead in drinking water was detected at 2 parts per billion (ppb) in the 90th percentile, which is below the EPA action level of 15 ppb, and meets applicable EPA standards. No violations for lead were noted in the report.

The Hamilton County Water Quality Report 2024 is included in Appendix J.

9.0 FINDINGS

This Phase I ESA was prepared in accordance with ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process Designation: E 1527-21, 40 CFR Part 312 Standards and Practices for All Appropriate Inquiries: Final Rule, U.S. Housing and Urban Development (HUD) Multifamily Accelerated Processing Guide, as amended, and the Ohio Housing Finance Agency (OHFA) environmental guidelines, and accepted Phase I ESA industry standards. This assessment has revealed the following findings, consisting of RECs, CRECs, HRECs, environmental concerns, and significant data gaps, based on the subject property inspection, interviews, and review of available records:

EVALUATED CONDITIONS	ON-SITE	ADJACENT
STANDARD ENVIRONMENTAL RECORDS REVIEW	NO	NO
UNREGULATED UNDERGROUND STORAGE TANK(S) (UST)	NO	NO
PAST INDUSTRIAL/DETRIMENTAL OPERATIONS	NO	NO
VAPOR ENCROACHMENT CONDITION	NO	NO
STORED HAZARDOUS MATERIALS	NO	NA
POLYCHLORINATED BIPHENYLS (PCBS)	NO	NA
ABOVEGROUND STORAGE TANK(S) (AST)	NO	NO
DUMPING, LANDFILLS	NO	NO
HAZARDOUS RUN-OFF	NO	NO
ASBESTOS-CONTAINING MATERIALS	NO	NA
LEAD-BASED PAINT	NO	NA
RADON GAS	NO	NA
FLOOD ZONE	NO	NO
WETLANDS	NO	NO
MOLD	NO	NA
LEAD IN DRINKING WATER	NO	NA
OTHER	NO	NA

NA = Not Applicable

10.0 OPINION

Recognized Environmental Conditions (RECs)
As defined in ASTM E 1527-21, RECs are (1) the presence of hazardous substances or petroleum products in, on, or at the subject property due to release to the environment; (2) the likely presence of hazardous substances or petroleum products in, on, or at the subject property due to a release or likely release to the environment; or (3) the presence of hazardous substances or petroleum products in, on, or at the subject property under conditions that pose a material threat of a future release to the environment. **Based on the findings of this Phase I ESA, no RECs were identified.**

Controlled Recognized Environmental Conditions (CRECs)
As defined in ASTM E 1527-21, a CREC is a REC affecting the subject property that has been addressed to the satisfaction of the applicable regulatory authority or authorities with hazardous substances or petroleum products allowed to remain in place subject to implementation of required controls (for example, activity and use limitations or other property use limitations). **Based on the findings of this Phase I ESA, no CRECs were identified.**

Historical Recognized Environmental Conditions (HRECs)
As defined in ASTM E 1527-21, an HREC is a previous release of hazardous substances or petroleum products affecting the subject property that has been addressed to the satisfaction of the applicable regulatory authority or authorities and meeting unrestricted use criteria established by the applicable regulatory authority or authorities without subjecting the subject property to any controls (for example, activity and use limitations or other property use limitations). A HREC is not a REC. **Based on the findings of this Phase I ESA, no HRECs were identified.**

Environmental Concerns
D3G defines "environmental concerns" as de minimis conditions and non-scope considerations for which further action is recommended. As defined in ASTM E 1527-21, a de minimis condition is a condition related to a release that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. A condition determined to be a de minimis condition is not a REC nor a CREC. Non-scope considerations include assessed environmental issues or conditions beyond the scope of ASTM E 1527-21 as stated in Section 2.2 and/or discussed below. **Based on the findings of this Phase I ESA, no environmental concerns were identified.**

Significant Data Gaps
As defined in ASTM E 1527-21, a significant data gap is a data gap that affects the ability of the environmental professional to identify a REC. A data gap is a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information. Data gaps may result from incompleteness in any of the activities required by this practice, including, but not limited to, site reconnaissance (for example, an inability to conduct the site visit), and interviews (for example, an inability to interview the key site manager, regulatory officials, etc.). **Based on the findings of this Phase I ESA, no significant data gaps were identified.**

11.0 CONCLUSIONS

Dominion Due Diligence Group performed a Phase I Environmental Site Assessment (ESA) in conformance with the scope and limitations of ASTM Practice E1527-21 of the St. Theresa Village located at 6783 Siebern Avenue in Silverton, Hamilton County, Ohio (subject property). Any exceptions to, or deletions from, this practice are described in Section 2.4 of this report. This assessment has revealed no evidence of recognized environmental conditions (RECs), controlled recognized environmental conditions (CRECs), or significant data gaps in connection with the subject property.

12.0 DEVIATIONS

There are no deviations from ASTM E1527-21 except for those outlined in Section 2.4 of this report.

13.0 ADDITIONAL SERVICES

D3G was additionally contracted to perform a HUD Environmental Review, which is provided under separate cover.

14.0 REFERENCE MATERIALS

- City of Silverton Fire and Health Departments
- Hamilton County Assessor
- Web Soil Survey accessed at http://websoilsurvey.nrcs.usda.gov/app/
- FEMA Flood Insurance Rate Map (FIRM) #3901C-0233E dated February 17, 2010
- Environmental Data Resources Inc. (EDR) Report, dated September 24, 2025
- Google Maps
- Google Earth and EDR — aerial photographs
- EDR Certified Sanborn Map Report
- Current USGS Topographic Quadrangle accessed via the USGS Map Locator Store - https://store.usgs.gov/map-locator
- EPA Radon Map
- USFWS National Wetlands Inventory map accessed at http://www.fws.gov/wetlands/Data/Mapper.html
- Municipal Authority of the Hamilton County Annual Drinking Water Quality Report 2024
- Architectural Site Plan prepared by Berardi Partners dated September 16 2025

15.0 SIGNATURE OF ENVIRONMENTAL PERSONNEL

Data presented in this report is factual to the best of our knowledge. Available sources of data were comprehensively researched to provide a complete Phase I ESA of the subject property. The Phase I ESA was prepared in accordance with ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM E1527-21), 40 CFR Part 312 Standards and Practices for All Appropriate Inquiry: Final Rule, portions of the U.S. Department of HUD MAP Guide protocols, as amended, and OHFA environmental guidelines. In addition, it should be noted that the HUD Environmental Review Record Related Federal Laws and Authorities Worksheets are included under separate cover.

D3G understands that this Phase I ESA will be used by the User to document to the U.S. Department of HUD that the MAP Lender's application for FHA multifamily mortgage insurance was prepared and reviewed in accordance with HUD requirements. This report has been made, presented, and delivered for the purpose of influencing an official action of the FHA, and of the Commissioner, and may be relied upon by the Commissioner as a true statement of the facts contained therein. D3G certifies that the review was in compliance with HUD program and processing requirements applicable on the date of the review and that D3G has no financial interest or family relationship with the officers, directors, shareholders, members, or partners of the Lender or affiliated entities, Borrower or affiliated entities, the General Contractor, any subcontractors, the buyer or seller of the proposed property and that D3G has not engaged in any business that might present a conflict of interest.

Site Assessor

Edward Nikolich

Ed Nikolich
Site Assessor

Environmental Technician

Dana Pelkey

Dana Pelkey
Environmental Technician

Environmental Professional

Alexis Brass
Environmental Professional

Principal

Robert Hazelton
Principal

I hereby certify under penalty of perjury that all of the information I have provided on this form and in any accompanying documentation is true and accurate. I acknowledge that if I knowingly have made any false, fictitious, or fraudulent statement, representation, or certification on this form or on any accompanying documents, I may be subject to criminal, civil, and/or administrative sanctions, including fines, penalties, and/or imprisonment under

applicable federal law, including but not limited to 12 U.S.C. § 1833a; 18 U.S.C. §§1001, 1006, 1010, 1012, and 1014; 12 U.S.C. §1708 and 1735f-14; and 31 U.S.C. §§3729 and 3802.

16.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in §312.10 of 40 CFR Part 312.

I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Lexi Brass qualifies as an **Environmental Professional** as defined in 40 CFR Part 312.10(b). Ms. Brass has numerous years of extensive training and experience with regards to environmental issues. She received an undergraduate B.A. degree in Environmental Science from the University of Virginia and has inspected, managed and designed numerous environmental projects throughout the United States. Ms. Brass also has extensive knowledge of the ASTM E1527 Phase I Environmental Site Assessment regulations as well as the EPA 40 CFR Part 312 Standards and Practices for All Appropriate Inquiries regulations. Ms. Brass qualifies as an Environmental Professional as defined under ASTM E 1527 Section 4.3 and Appendix X2 with over five (5) years of experience performing investigations of surface and subsurface environmental conditions. Ms. Brass's duties as a Team Manager for Dominion Due Diligence Group include coordinating, conducting and reviewing Phase I Environmental Site Assessments (HUD, ASTM E1527, state tax credits, Fannie Mae, Freddie Mac, etc.), as well as Environmental Reviews throughout the United States, consisting of compliance evaluations with the National Environmental Policy Act (NEPA) and other project-specific guidance requirements (MAP, LEAN, HOME, HTF, RAD, SAC, etc.). Ms. Brass has additionally performed numerous HUD noise assessments throughout the United States.

Appendix A:

Site (Vicinity) Maps

Appendix A Tax Map	↑ **N**	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio *Parcel #: 602-0001-0059-00*	**DOMINION DUE DILIGENCE GROUP**

Jessica E. Miranda, Hamilton County Auditor

generated on 9/29/2025 12:05:00 PM EDT

Property Report

Parcel ID	Address	Index Order	Tax Year
602-0001-0059-00	6783 SIEBERN AVE	Parcel Number	2024 Payable 2025

Property Information

Tax District 015 - SILVERTON-CINTI CSD
School District CINCINNATI CSD

Images/Sketches

Appraisal Area
60201 - SILVERTON 01
Sales

Auditor Land Use
413 - INDEPENDENT LIVING (SENIO

Owner Name and Address
ST THERESA VILLAGE INC
6783 SIEBERN AVE
CINCINNATI OH 45238
(Questions? 946-4015 or county.auditor@auditor.hamilton-co.org)

Tax Bill Mail Address
ST THERESA VILLAGE
ATTN: ASSET MANAGEMENT
1600 BROADWAY, SUITE 2000
DENVER CO 80202
(Questions? 946-4800 or treasurer.taxbills@hamilton-co.org)

Assessed Value
838,110

Effective Tax Rate
80.906198

Total Tax
$67,927.76

Property Description
SIEBERN AVE 2.105 AC R2-T4-S24 PRS 59-432 CONS

Appraisal/Sales Summary

Year Built	1996
Total Rooms	0
# Bedrooms	0
# Full Bathrooms	0
# Half Bathrooms	0
Last Transfer Date	12/13/1995
Last Sale Amount	$140,000
Conveyance Number	15421
Deed Type	WE - Warranty Deed (EX)
Deed Number	769248
# of Parcels Sold	1
Acreage	2.171

Tax/Credit/Value Summary

Board of Revision	YES(21)
Rental Registration	No
Homestead	No
Owner Occupancy Credit	No
Foreclosure	No
Special Assessments	Yes
Market Land Value	192,920
CAUV Value	0
Market Improvement Value	2,201,690
Market Total Value	2,394,610
TIF Value	0
Abated Value	0
Exempt Value	0
Taxes Paid	$33,963.88

Notes

3/12/24 DV SECTION 8 PER 1/1/24 STATE LIST ** 10/20/21 - decrease to 2,300,000 ** 6/7/21 BOR #20-052528 NO CHANGE JAW ** 6-23-98 BLDG 100% FOR 1998

Structure List

Structure Name	Use Code	Finished Sq. Ft.	Year Built
Structure 1	413 INDEPENDENT LIVING (SENIO	42,252	1996

Commercial Appraisal Data

Section	Occupancy	Finished Area (sq. ft.)	Story Height	Stories
Section 1	313 Convalescent Hospital	14,558	9	1
Section 2	313 Convalescent Hospital	14,332	9	1
Section 3	313 Convalescent Hospital	13,362	9	1

Improvements

Improvement	Measurements	Year Built
525-Asphalt	12000	1996

Proposed Levies

Levy	Levy Type	Mills	Current Annual Tax	Estimated Annual Tax	Note
Cincinnati CSD - Emergency ($48,000,000)	Renewal	5.05	$4,383.32	$4,232.46	B, C
Deer Park-Silverton JFD - Fire & EMS	Additional	3.50	$0.00	$2,933.39	B
Great Parks - Parks	Renewal	1.00	$689.41	$689.41	B, C

Levies Passed - 2025 Pay 2026 Tax Bill

Levy	Levy Type	Mills	Current Annual Tax	Estimated Annual Tax	Note
Silverton - Current Expense	Renewal	5.00	$2,594.60	$2,594.60	A

This is an estimated levy payment based on the current value of your property. Actual tax amounts per tax year may vary based on changes in property valuation and based on whether a parcel receives any abatement, credit, or reduction during the levy period.

Effective for the tax year 2005, Ohio's biennial budget bill, Amended Substitute House Bill 66, signed by the Governor on June 30, 2005, terminates the 10 percent real property tax rollback for the commercial and industrial classes of property, and agricultural property used for the commercial production of timber.

Effective for the tax year 2013, Ohio's biennial budget bill, House Bill 59, signed by the Governor on June 30, 2013, terminates the 10 percent real property tax rollback and the 2.5 percent homestead credit on all additional or replacement levies passed at the November 5, 2013 election or after. As a result of this legislation, those same levies will not qualify for the stadium tax credit.

Existing and renewal levies, as well as levies passed at the May 7,2013 and August 6, 2013 elections will qualify for the credits. Residential and most agricultural properties with qualifying levies will receive what is now the Non-Business Credit Rollback Factor. Owner occupied residential dwellings with qualifying levies will receive what is now the Owner Occupancy Credit Rollback Factor, as well as the stadium tax credit.

Transfer History

Year	Conveyance #	Selling Price	Transfer Date	Previous Owner	Current Owner
1995	15421	140,000	12/13/1995	SEE OWNERSHIP CARD	ST THERESA VILLAGE INC

Value History

Tax Year	Assessed Date	Land	Improvements	Total	CAUV	Reason for Change
2023	7/29/2023	192,920	2,201,690	2,394,610	0	120 Reappraisal, Update or Annual Equalization
2021	10/29/2021	171,010	2,128,990	2,300,000	0	40 Changes by Board of Revision, Tax Appeals, Courts
2020	10/29/2021	171,010	2,128,990	2,300,000	0	40 Changes by Board of Revision, Tax Appeals, Courts
2020	8/22/2020	171,010	2,291,310	2,462,320	0	120 Reappraisal, Update or Annual Equalization
2017	11/15/2017	159,820	2,141,410	2,301,230	0	120 Reappraisal, Update or Annual Equalization
2014	9/19/2014	147,350	2,051,510	2,198,860	0	120 Reappraisal, Update or Annual Equalization
2011	9/5/2011	150,360	2,093,380	2,243,740	0	120 Reappraisal, Update or Annual Equalization
2008	9/27/2008	170,770	1,832,900	2,003,670	0	120 Reappraisal, Update or Annual Equalization
2005	9/28/2005	164,200	1,762,400	1,926,600	0	120 Reappraisal, Update or Annual Equalization
2002	10/8/2002	148,600	1,564,300	1,712,900	0	120 Reappraisal, Update or Annual Equalization
1999	11/6/1999	140,500	1,478,500	1,619,000	0	30 New Construction - Full Value
1999	11/6/1999	140,500	0	140,500	0	120 Reappraisal, Update or Annual Equalization
1998	7/10/1998	140,000	2,513,300	2,653,300	0	30 New Construction - Full Value
1997	11/21/1997	140,000	1,193,800	1,333,800	0	110 Miscellaneous
1997	11/21/1997	147,000	1,193,800	1,340,800	0	110 Miscellaneous
1997	9/2/1997	280,000	1,193,800	1,473,800	0	30 New Construction - Full Value
1997	5/7/1996	280,000	0	280,000	0	50 Changes to/from Exempt Property
1997	5/7/1996	0	0	0	0	110 Miscellaneous
1996	1/1/1996	133,000	0	133,000	0	110 Miscellaneous

Board of Revision Case History

Case Number	Date Filed	Withdrawn	**Counter Complaint Filed	*Hearing Date/Time	Value Challenged	Value Requested	Value Decided by BOR	***Date Resolved
2020052528	4/8/2021	No		6/1/2021 11:00 AM	2,462,320	2,000,000	2,462,320	6/8/2021
2013704719	5/7/2014	Yes	5/7/2014	1/1/1900 12:00 AM	2,243,740	1,109,410		

*Once your hearing has been scheduled, you will receive a **Notice of Hearing** by certified mail or email, and the Scheduled Hearing Date and Time will be populated on this page.
**A counter-complaint may by filed by a party with interest in the value of your property, such as the Board of Education, if you request a decrease.

***Please allow six to eight weeks to receive your **Notice of Result** by certified mail and to see your result on this page. Your Notice will contain basic facts about appealing your Board of Revision decision, should you wish to do so.

Payment Information

JILL A. SCHILLER, TREASURER

Mail Payments to:	Hamilton County Treasurer 138 E. Court Street, Room 402 Cincinnati, Ohio 45202
Tax District:	015 - SILVERTON-CINTI CSD

Current Owner(s)	ST THERESA VILLAGE INC
Tax Bill Mail Address	ST THERESA VILLAGE ATTN: ASSET MANAGEMENT 1600 BROADWAY, SUITE 2000 DENVER CO 80202

Taxable Value	
Land	67,520
Improvements	770,590
Total	838,110

Tax Overview

Tax Lien Pending	No
Tax Lien Sold	No
Full Rate	108.870000
Effective Rate	80.906198
Non Business Credit	0.087124
Owner Occupancy Credit	0.021781
Certified Delinquent Year	
Delinquent Payment Plan	No
TOP (Treasurer Optional Payment) Note: May represent multiple parcels	$0.00

Current Year Tax Detail

	Prior Delinquent	Adj. Delinquent	1st Half	Adj. 1st Half	2nd Half	Adj. 2nd Half
Real Estate			$45,622.52		$45,622.52	
Credit			$11,718.37		$11,718.37	
Subtotal			$33,904.15		$33,904.15	
Non Business Credit			$0.00		$0.00	
Owner Occupancy Credit			$0.00		$0.00	
Homestead			$0.00		$0.00	
Sales CR			$0.00		$0.00	
Subtotal	**$0.00**	**$0.00**	**$33,904.15**	**$0.00**	**$33,904.15**	**$0.00**
Interest/Penalty	$0.00	$0.00	$0.00	$0.00	$3,396.39	$0.00
Real Estate Paid	$0.00		$33,904.15		$0.00	
Real Estate Owed	$0.00		$0.00		$37,294.57	
Special Assess Paid	$0.00		$59.73		$0.00	
Special Assess Owed	$0.00		$0.00		$65.70	
Total Due	$0.00		$33,963.88		$37,360.27	
Total Paid	$0.00		$33,963.88		$0.00	
Unpaid Delq Contract	$0.00		$0.00		$0.00	
Total Owed	**$0.00**		**$0.00**		**$37,360.27**	

Special Assessment Detail for 13-999 STORM WATER

	Prior Delinquent	Adj. Delinquent	1st Half	Adj. 1st Half	2nd Half	Adj. 2nd Half
Charge	$0.00	$0.00	$59.73	$0.00	$59.73	$0.00
Interest/Penalty	$0.00	$0.00	$0.00	$0.00	$5.97	$0.00
Paid	$0.00		$59.73		$0.00	
Owed	$0.00		$0.00		$65.70	

Payment Information for Current And Prior Year

Date	Half	Prior	1st Half	2nd Half	Surplus
2/5/2025	1 - 2024	$0.00	$33,963.88	$0.00	$0.00
6/17/2024	2 - 2023	$0.00	$0.00	$33,878.15	$0.00
2/5/2024	1 - 2023	$0.00	$33,878.15	$0.00	$0.00
6/15/2023	2 - 2022	$0.00	$0.00	$36,980.96	$0.00
1/30/2023	1 - 2022	$0.00	$36,980.96	$0.00	$0.00
6/17/2022	2 - 2021	$0.00	$0.00	$36,645.15	$0.00
1/28/2022	1 - 2021	$0.00	$36,645.15	$0.00	$0.00
6/21/2021	2 - 2020	$0.00	$0.00	$38,803.87	$0.00
2/5/2021	1 - 2020	$0.00	$38,803.87	$0.00	$0.00
7/17/2020	2 - 2019	$0.00	$0.00	$39,768.28	$0.00
1/31/2020	1 - 2019	$0.00	$39,768.28	$0.00	$0.00

Information believed accurate but not guaranteed. Treasurer disclaims liability for any errors or omissions

Contact the County Treasurer with your tax bill questions at county.treasurer@hamilton-co.org or 513-946-4800

Current Year
2024 Payable 2025
Prior Year
2023 Payable 2024

Tax Distribution Information

Market Value / Assessed Value (35%)

	Market Value		Assessed Value (35%)
Land	192,920	Land	67,520
Building	2,201,690	Building	770,590
Total	**2,394,610**	**Total**	**838,110**

Tax Rate Information

Full Tax Rate (mills)	108.870000
Reduction Factor	0.256855
Effective Tax Rate (mills)	80.906198
Non Business Credit	0.087124
Owner Occupancy Credit	0.021781

Tax Calculations

Gross Real Estate Tax	$91,245.04
- Reduction Amount	$23,436.74
- Non Business Credit	$0.00
- Owner Occupancy Credit	$0.00
- Homestead	$0.00
Half Year Real Taxes	$33,904.15
- Sales Tax Credit	$0.00
+ Current Assessment	$59.73
+ Delinquent Assessment	$0.00
+ Delinquent Real Estate	$0.00
Semi Annual Net	$33,963.88

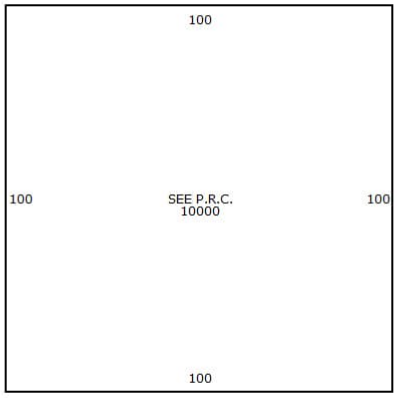
Half Year Tax Distributions

School District	$20,398.52
Township	$0.00
City/Village	$5,121.26
Joint Vocational School	$0.00
County General Fund	$947.05
Public Library	$906.89
Family Service/Treatment	$117.20
HLTH/Hospital Care-Indigent	$938.18
Mental Health Levy	$946.45
Developmental Disabilities	$1,423.63
Park District	$716.21
Crime Information Center	$104.37
Children Services	$1,587.08
Senior Services	$542.38
Zoological Park	$154.93

This shows the most recent tax bill calculation which normally occurs in early December and May. However, adjustments or corrections may have been applied to the tax bill after the initial tax calculation. Go to the Payment Detail tab to view any corrections or adjustments occurring after the initial tax calculation.

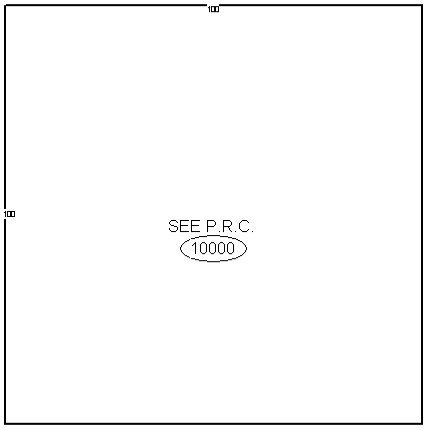
Parcel Photo

Current Parcel Sketch



Sketch by Apex Medina™

Legacy Parcel Sketch



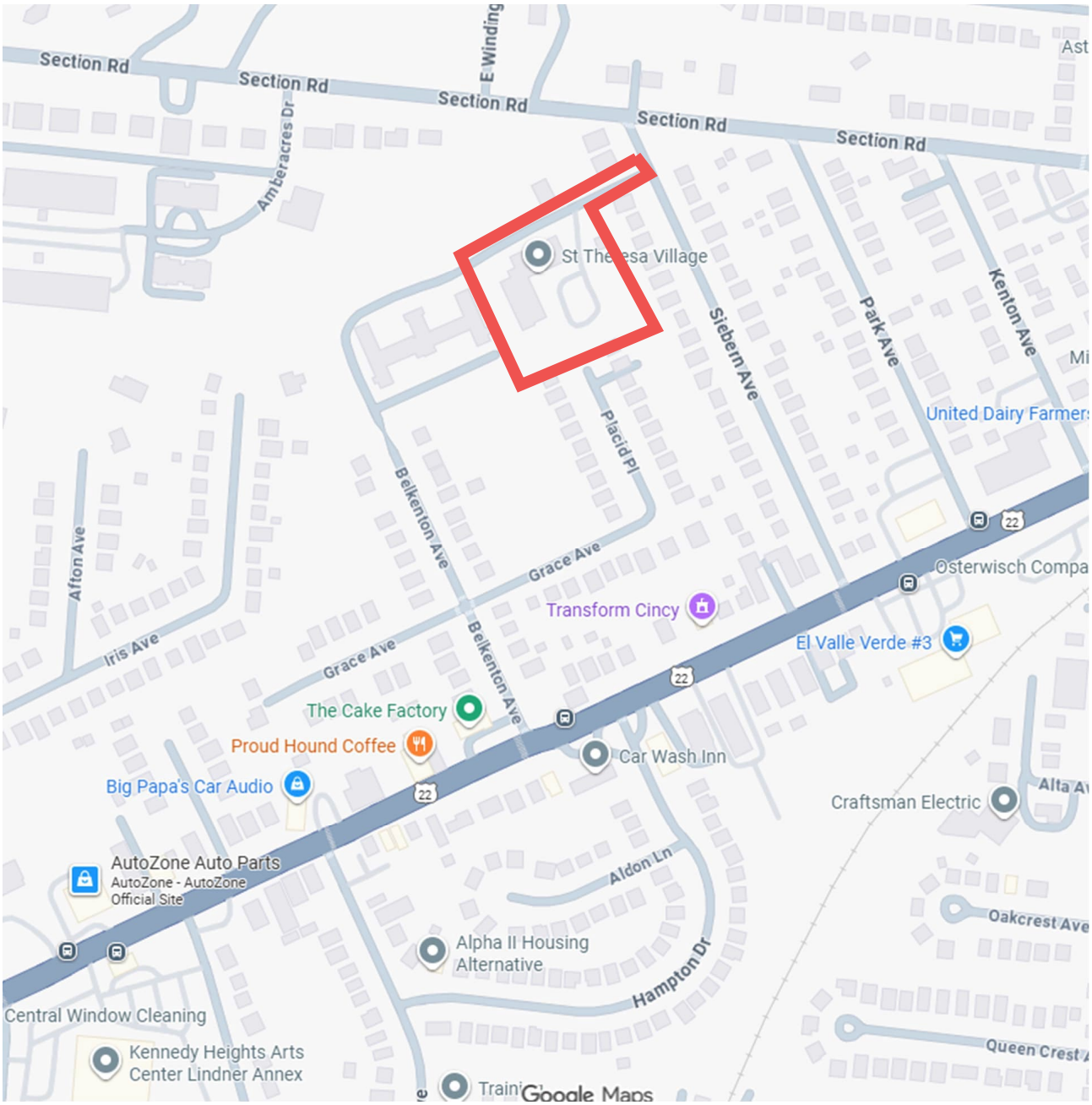
Special Assessments

Project	Ord/Res	Description	Certified	End Year	Payoff Amount
13-999		STORM WATER	11/7/2024	2099	$65.70

Related Names

Name	Relationship	Status
ST THERESA VILLAGE INC	Parcel Owner	Current
ST THERESA VILLAGE	Mail Name	Current

Appendix A Site Topographic Map	↑ **N**	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio *Topographic Quadrangle:* *Cincinnati East, Ohio 2023*	**DOMINION DUE DILIGENCE GROUP**



Appendix A Site Locator Map	↑ N	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio	**DOMINION DUE DILIGENCE GROUP**

Soil Map—Hamilton County, Ohio
(St. Theresa Village)

Map Scale: 1:962 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 10 20 40 60

Feet: 0 45 90 180 270

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

USDA Natural Resources Conservation Service | Web Soil Survey National Cooperative Soil Survey | 9/24/2025 Page 1 of 3

Appendix A Site Soils Map	↑ **N**	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio *http://websoilsurvey.nrcs.usda.gov/app/*	**DOMINION DUE DILIGENCE GROUP**

Map Unit Description (Brief, Generated)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, provide information on the composition of map units and properties of their components.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The Map Unit Description (Brief, Generated) report displays a generated description of the major soils that occur in a map unit. Descriptions of non-soil (miscellaneous areas) and minor map unit components are not included. This description is generated from the underlying soil attribute data.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description (Brief, Generated)

Hamilton County, Ohio

Map Unit: UfAXC—Urban land-Alfic Udarents complex, fragipan substratum over till, 0 to 12 percent slopes

Component: Urban land (55%)

Generated brief soil descriptions are created for major soil components. The Urban land is a miscellaneous area.

Component: Alfic Udarents (40%)

The Alfic Udarents component makes up 40 percent of the map unit. Slopes are 0 to 12 percent. This component is on till plains on uplands. The parent material consists of loess over pedisediment over till. Depth to a root restrictive layer, fragipan, is 0 to 59 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria.

Component: Rossmoyne, eroded (2%)

Generated brief soil descriptions are created for major soil components. The Rossmoyne, eroded soil is a minor component.

Component: Cincinnati, moderately eroded (2%)

Generated brief soil descriptions are created for major soil components. The Cincinnati, moderately eroded soil is a minor component.

Component: Avonburg (1%)

Generated brief soil descriptions are created for major soil components. The Avonburg soil is a minor component.

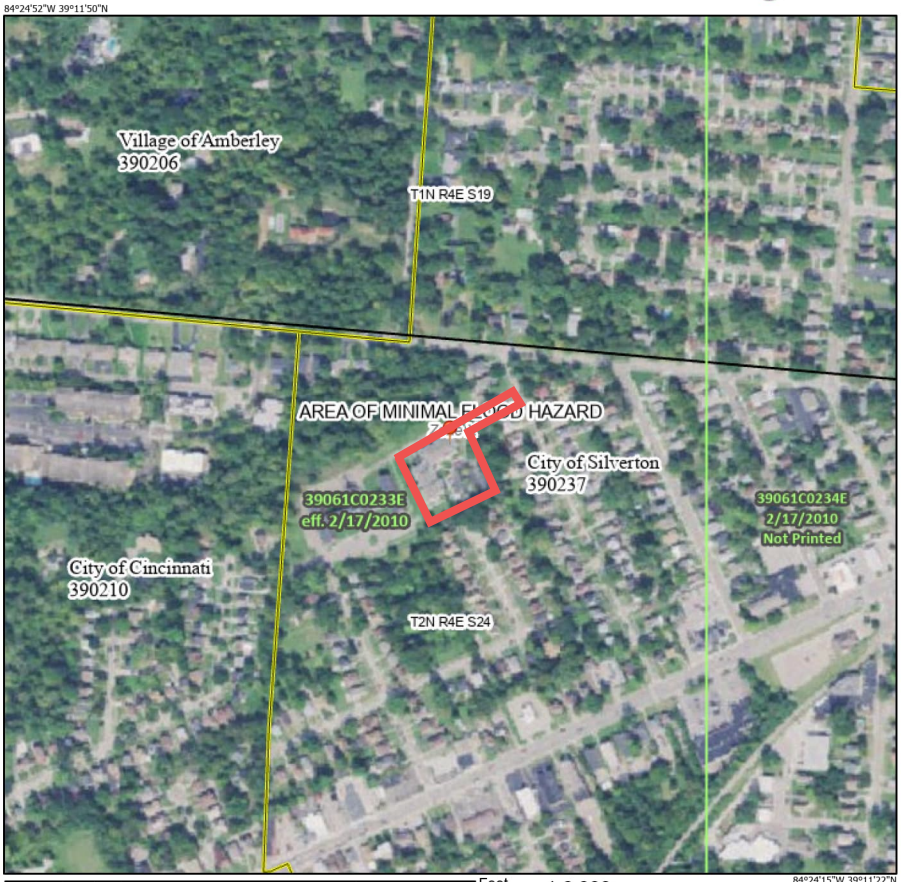
Data Source Information

Soil Survey Area: Hamilton County, Ohio
Survey Area Data: Version 24, Aug 28, 2024

National Flood Hazard Layer FIRMette

FEMA

84°24'52"W 39°11'50"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

84°24'15"W 39°11'22"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/24/2025 at 7:15 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix A FEMA Flood Insurance Rate Map	↑ **N**	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio *Community Panel #:* *39061C-0233E dated February 17, 2010*	**DOMINION DUE DILIGENCE GROUP**

The subject property firm number is not listed

FEMA (//www.fema.gov/)

Navigation

Search

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Hazus (/portal/resources/hazus)

LOMC Batch Files (/portal/resources/lomc)

Product Availability (/portal/productAvailability)

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Choose one of the three search options below and optionally enter a posting date range.

Jurisdiction	Jurisdiction Name	Product ID
State	**Jurisdiction Name or FEMA ID**	**Product ID**
-- Select --	SILVERTON, CITY OF	
	(Ex. Fairfax County-wide or 51059C)	*(Ex. Panel Number, LOMC Case Number)*

Filter By Posting Date Range *(Optional)*

Search | Clear All Fields

Search Results for SILVERTON, CITY OF

Click subscribe to receive email notifications when products are updated.

Click to download a listing of all products.

If you are a person with a disability, are blind, or have low vision, and need assistance, please contact a map specialist (https://msc.fema.gov/portal/resources/contact).

Please Note: Searching All Products by county displays all products for all communities within the county. You can refine your search results by specifying your specific jurisdiction location using the drop-down menus above.

Expand All

Effective Products (9)

Preliminary Products (3)

Please note: Preliminary data are for review and guidance purposes only. By viewing preliminary data and maps, the user acknowledges that the information provided is preliminary and subject to change. Preliminary data, including new or revised FIRMs, FIS reports, and FIRM Databases, are not final and are presented on the MSC as the best information available at this time. Additionally, preliminary data cannot be used to rate flood insurance policies or enforce the Federal mandatory purchase requirement. FEMA will remove preliminary data once effective data are available.

Preliminary FIRM Panels (3) DL ALL

Please note: Searches often result in many map files listed under a given section. You can determine the Product ID for the individual map panel needed by looking at the Map Index file. The index map files have "IND" within the Product ID and appear at the start of the list. These index files show an overview of a jurisdiction and how it is subdivided into map panels with the Product ID for each panel shown.

Show 100 **entries**

Showing 1 to 3 of 3 entries

Previous 1 Next

Product ID	Issue Date	Size	Download
39061CIND1B	03/05/2021	1 MB	DL (/portal/downloadProduct?productTypeID=PRELIM_PRODUCT&productSubTypeID=PRELIM_FIRM_INDEX&p
39061CIND1G	02/03/2023	2 MB	DL (/portal/downloadProduct?productTypeID=PRELIM_PRODUCT&productSubTypeID=PRELIM_FIRM_INDEX&p
39061CIND2B	03/05/2021	1 MB	DL (/portal/downloadProduct?productTypeID=PRELIM_PRODUCT&productSubTypeID=PRELIM_FIRM_INDEX&p

Preliminary FIS Reports (0)

Preliminary FIRM Database (0)

Pending Product (0)

Historic Products (19)

Flood Risk Products (0)

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U.S. Fish and Wildlife Service
National Wetlands Inventory

St. Theresa Village

September 24, 2025

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

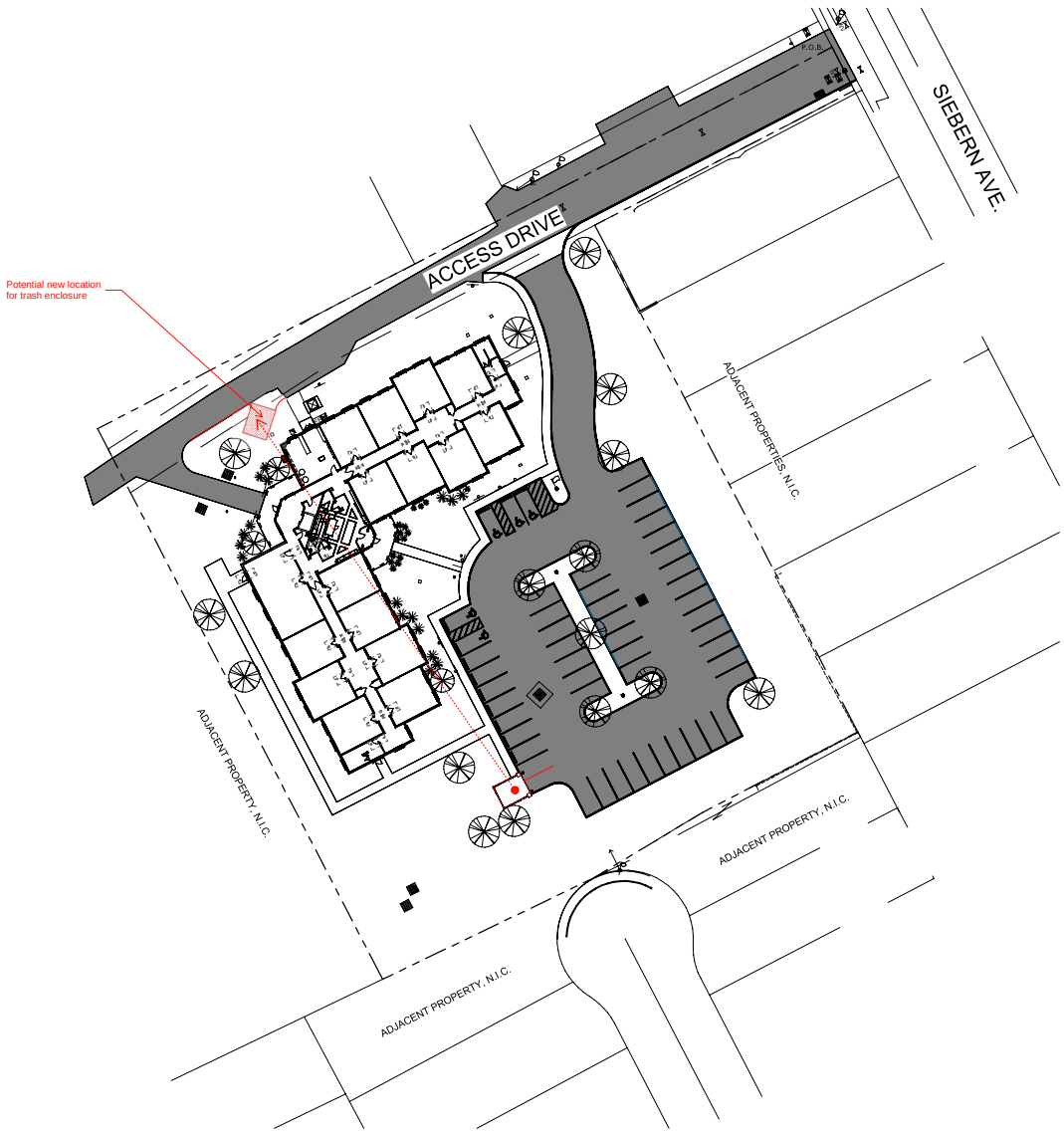
National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix A National Wetland Inventory Map	↑ N	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio *USFWS National Wetlands Inventory*	**DOMINION DUE DILIGENCE GROUP**

Appendix B:

Site Plan

Appendix B Site Plan	↑ **N**	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio	**DOMINION DUE DILIGENCE GROUP**



architectural site plan

1" = 30'-0"

planting schedule				
TAG	BOTANICAL NAME	COMMON NAME	COUNT	REMARKS
		<varies>	51	
			51	

general zoning information:

ADDRESS: tbd
PARCEL NUMBER: tbd
EXISTING ZONING CLASSIFICATION/DISTRICT: tbd
PROPOSED ZONING CLASSIFICATION/DISTRICT: tbd
EXISTING HEIGHT DISTRICT: tbd
PROPOSED HEIGHT DISTRICT: tbd
COMMERCIAL OVERLAY: tbd
TOTAL SITE AREA: tbd
FLOOD INSURANCE RATE MAP NUMBER: tbd
MOST RECENT EFFECTIVE DATE OF FIRM: tbd
BASE FLOOD ELEVATION: tbd

general project information:

EXISTING ZONING MAXIMUM BUILDING HEIGHT:
PROPOSED ZONING MAXIMUM BUILDING HEIGHT:
PROPOSED BUILDING HEIGHT:
BUILDING USE:
BUILDING AREA:
NUMBER OF DWELLING UNITS (RESIDENTIAL ONLY):
PROPOSED REFUSE SERVICE (RESIDENTIAL ONLY):
PROPOSED REFUSE CAPACITY C.Y. (RESIDENTIAL ONLY):
PARKING SPACES:

site data table:

TOTAL SITE AREA: tbd
TOTAL DISTURBED AREA: tbd
PRE-DEVELOPED IMPERVIOUS: tbd
POST-DEVELOPED IMPERVIOUS: tbd

parking calculation:

REQUIRED RESIDENTIAL PARKING (1.5 PER UNIT): tbd
PROPOSED RESIDENTIAL PARKING: tbd
REQUIRED COMMERCIAL (RETAIL) PARKING (1 PER 250 SF *.5): tbd
PROPOSED COMMERCIAL PARKING: tbd
REQUIRED ADA PARKING (VAN/TOTAL): tbd
PROPOSED ADA PARKING (VAN/TOTAL): tbd

bicycle parking calculation:

BICYCLE PARKING REQUIRED
(1 SPACE PER 20 VEHICULAR SPACES / MAX. 20): tbd
PROPOSED BICYCLE PARKING: tbd

shade tree calculation:

DWELLING UNIT SHADE TREES REQUIREMENTS
(1 PER 10 DWELLING UNITS): tbd
DWELLING UNIT SHADE TREES PROVIDED: tbd

ST. THERESA VILLAGE

6783 SIEBERN AVE.
CINCINNATI, OH 45236

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1. ALL BIDDERS SHALL VISIT THE SITE AND BECOME FAMILIAR W/ THE EXISTING CONDITIONS AND REQUIREMENTS OF THE PROJECT AND SHALL NOTIFY THE ARCHITECT OF ANY ERRORS AND OMISSIONS SUBSEQUENTLY DISCOVERED IN THE CONTRACT DOCUMENTS.
2. THE CONTRACT DOCUMENTS ARE COMPRISED OF THE DRAWINGS AND THE PROJECT MANUAL. IN THEIR ENTIRETY, THE INFORMATION IN THESE DOCUMENTS IS DEPENDENT UPON AND COMPLEMENTARY OF EACH OTHER. SEPARATION OF THE CONTRACT DOCUMENTS SHALL NOT BE PERMITTED IF THE CONTRACTOR CHOOSES TO SEPARATE THE DOCUMENTS, THEY DO SO AT THEIR OWN RISK AND EXPENSE.
3. ADDITIONALLY, SEE GENERAL INFORMATION ON G0' SHEETS.
4. THE CLIENT ACKNOWLEDGES THE CONSULTANTS (ARCHITECT) DRAWINGS AND SPECIFICATION, INCLUDING ALL DOCUMENTS ON ELECTRONIC MEDIA AS INSTRUMENTS OF THE CONSULTANTS (ARCHITECT) PROFESSIONAL SERVICE. THE CLIENT SHALL NOT REUSE OR MAKE OR PERMIT TO BE MADE ANY MODIFICATION TO THE DRAWINGS AND SPECIFICATIONS WITHOUT THE PRIOR WRITTEN AUTHORIZATION OF THE CONSULTANT (ARCHITECT). THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST THE CONSULTANT (ARCHITECT) ARISING FROM ANY UNAUTHORIZED TRANSFER, REUSE OR MODIFICATION OF THE DRAWINGS AND SPECIFICATIONS.
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80% CD

PROJECT DATE: 10.31.2025
PROJECT #: 24126

#	Description	Date

NOT FOR CONSTRUCTION

SITE PLAN

AS101

BERARDI+
ARCHITECTURE | INTERIOR DESIGN | ENGINEERING
1398 GOODALE BOULEVARD, COLUMBUS, OHIO 43212
P 614.221.1110 berardipartners.com

9/16/2025 11:43:43 AM

C:\Users\egambina.BPI\Documents\24-24126_St.Theresa Village_Site_egambina.rvt

Appendix C:

Site Photographs

1: View of the subject property signage

2: View of the subject property

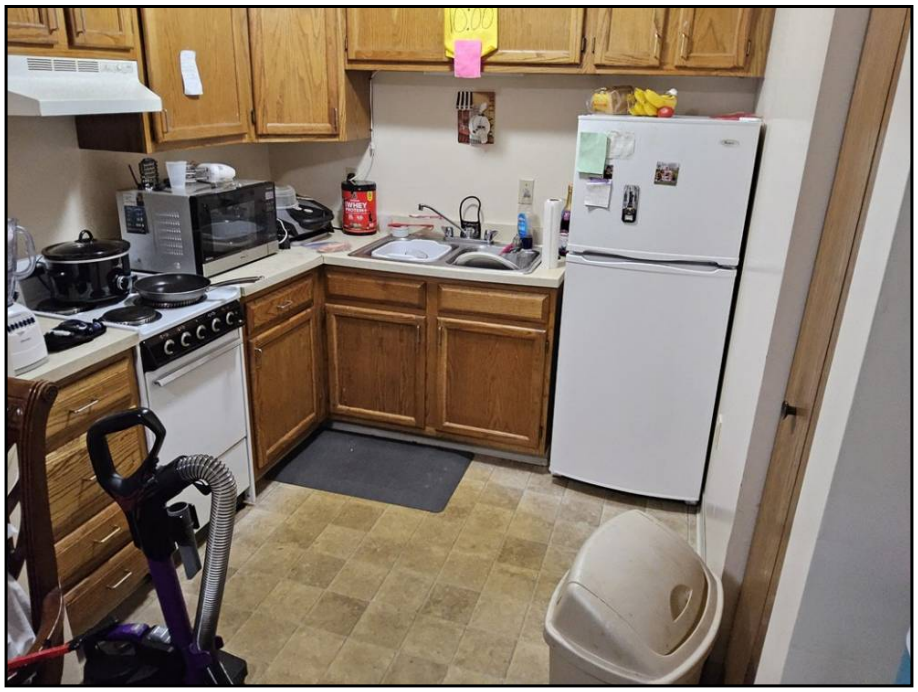
3: View of the subject property

4: View of the subject property

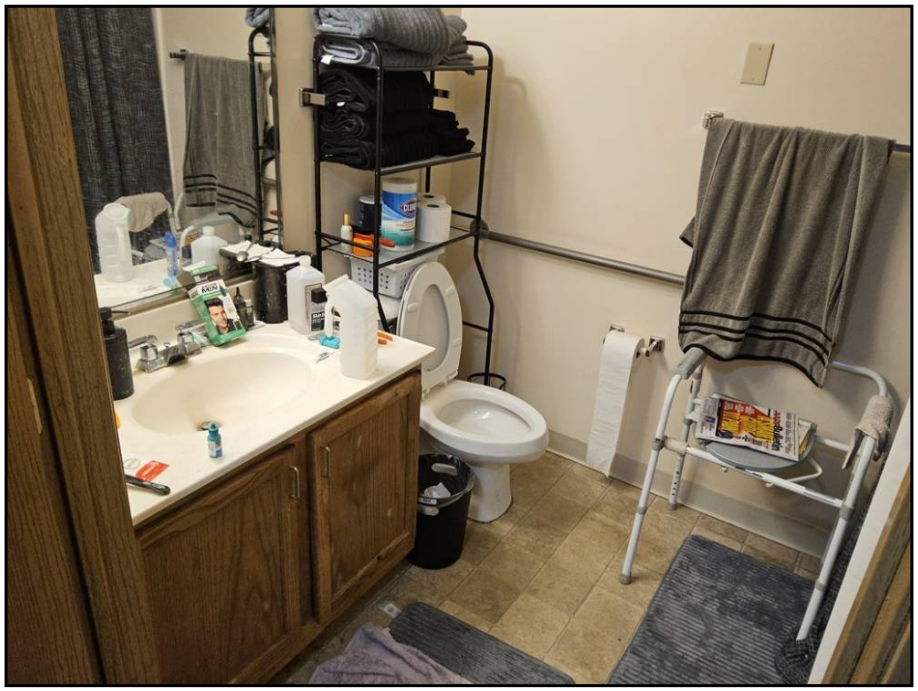
5: View of the subject property

6: View of the typical residential living room

7: View of the typical residential bedroom



8: View of the typical residential kitchen



9: View of the typical residential bathroom

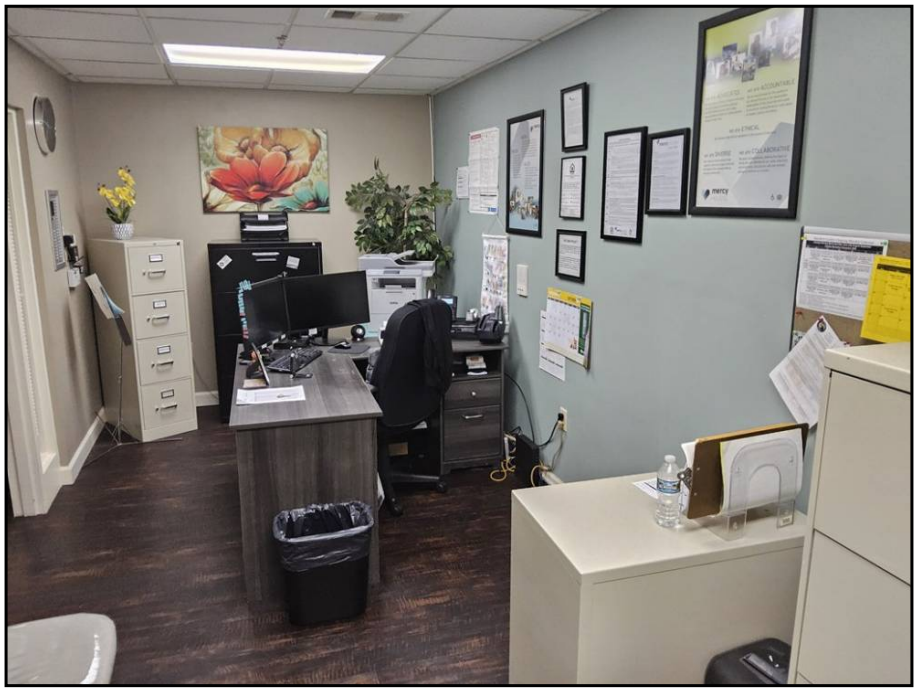
10: View of the laundry facilities

11: View of the community dining space

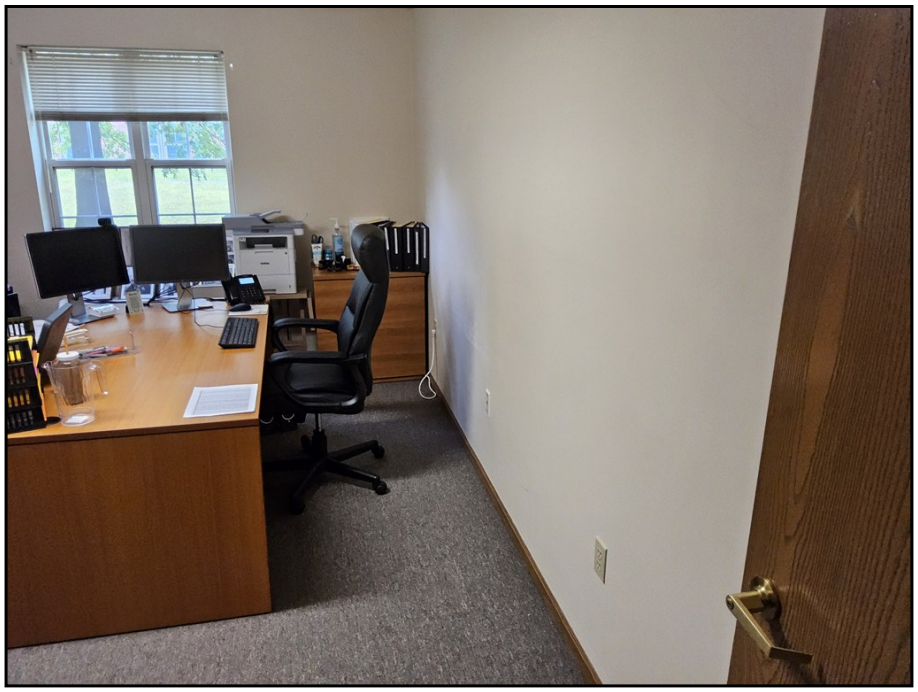
12: View of the community kitchen

13: View of the Wellness Center

14: View of the mail kiosk



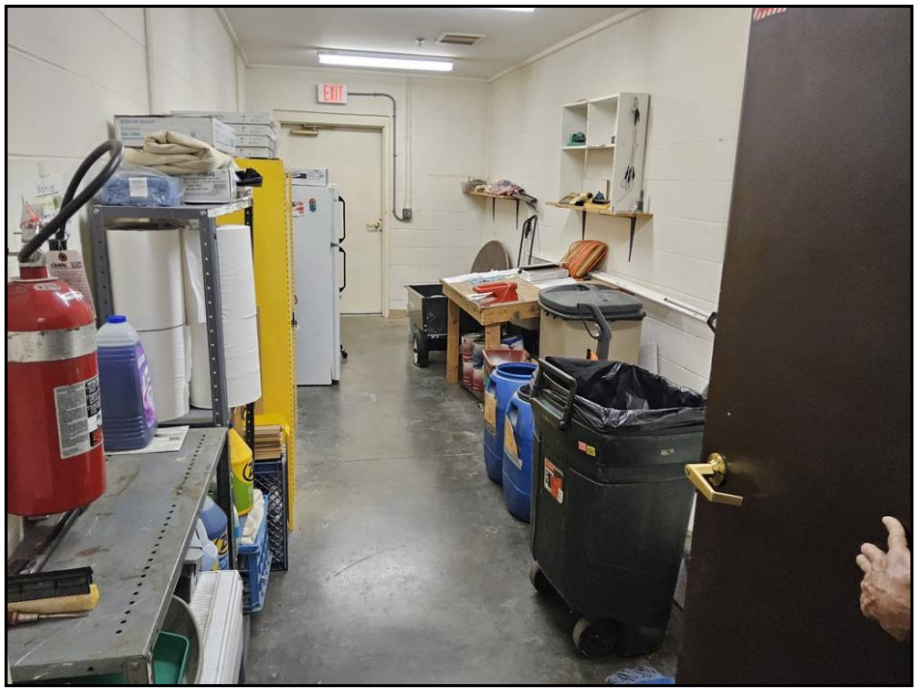
15: View of the leasing center



16: View of a typical office

17: View of a storage room

18: View of the elevator



19: View of a storage area

20: View of the maintenance area

21: View of a typical patio

22: View of the exterior shed

23: View of the pad-mounted transformer

24: View of the dumpster

25: View of the elevator equipment

26: View of the northern adjacent undeveloped wooded land

27: View of a typical northern adjacent multi-family residential

28: View of typical eastern adjacent single-family residential

29: View of a typical southern adjacent single-family residential

30: View of the western vacant, former St. Theresa Care Center

Appendix D:

Historical Research Documents

St. Theresa Village

6783 Siebern Avenue

CINCINNATI, OH 45236

Inquiry Number: 8118979.3

September 24, 2025

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

09/24/25

Site Name:	Client Name:
St. Theresa Village	Dominion Environmental Group, Inc
6783 Siebern Avenue	201 Wylderose Drive
CINCINNATI, OH 45236	Midlothian, VA 23113
EDR Inquiry # 8118979.3	Contact: Dana M Pelkey

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The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 145F-43A5-BE8D

PO # HPS-ENV1

Project 2025-001881

Maps Provided:

1981
1950
1937
1922

Sanborn® Library search results

Certification #: 145F-43A5-BE8D

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

The Sanborn Library LLC Since 1866™

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Sanborn Sheet Key

This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.

1981 Source Sheets

Volume 11&12, Sheet 1209
1981

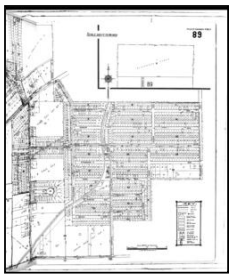
1950 Source Sheets

Volume 11, Sheet 1209
1950

1937 Source Sheets

Volume 11, Sheet 1209
1937

1922 Source Sheets



Volume 2, Sheet 89
1922

Certified Sanborn® Map

1922

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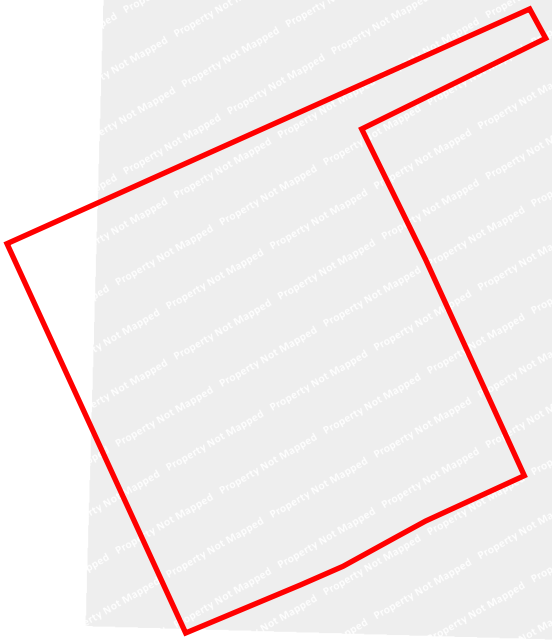
Certification # 145F-43A5-BE8D



Site Name:	St. Theresa Village
Address:	6783 Siebern Avenue
City, ST, ZIP:	CINCINNATI, OH 45236
Client:	Dominion Environmental Group, Inc
EDR Inquiry:	8118979.3
Order Date:	09/24/2025
Certification #	145F-43A5-BE8D
Copyright	1922

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Outlined areas indicate map sheets within the collection.

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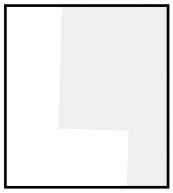

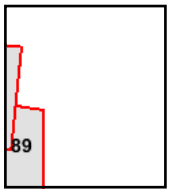

Volume 2, Sheet 89

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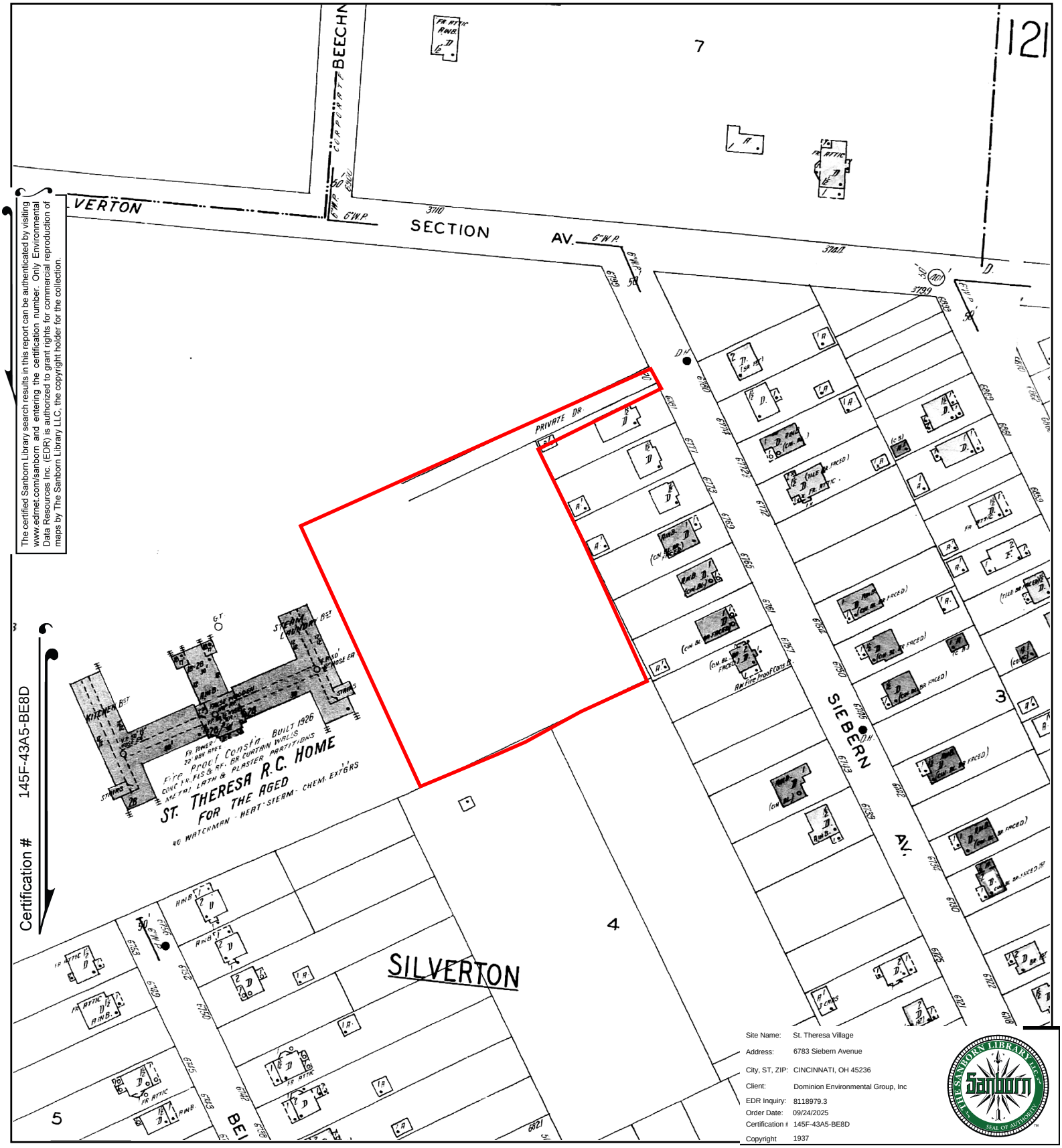
Certified Sanborn® Map

1937



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Volume 11, Sheet 1209

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Certified Sanborn® Map

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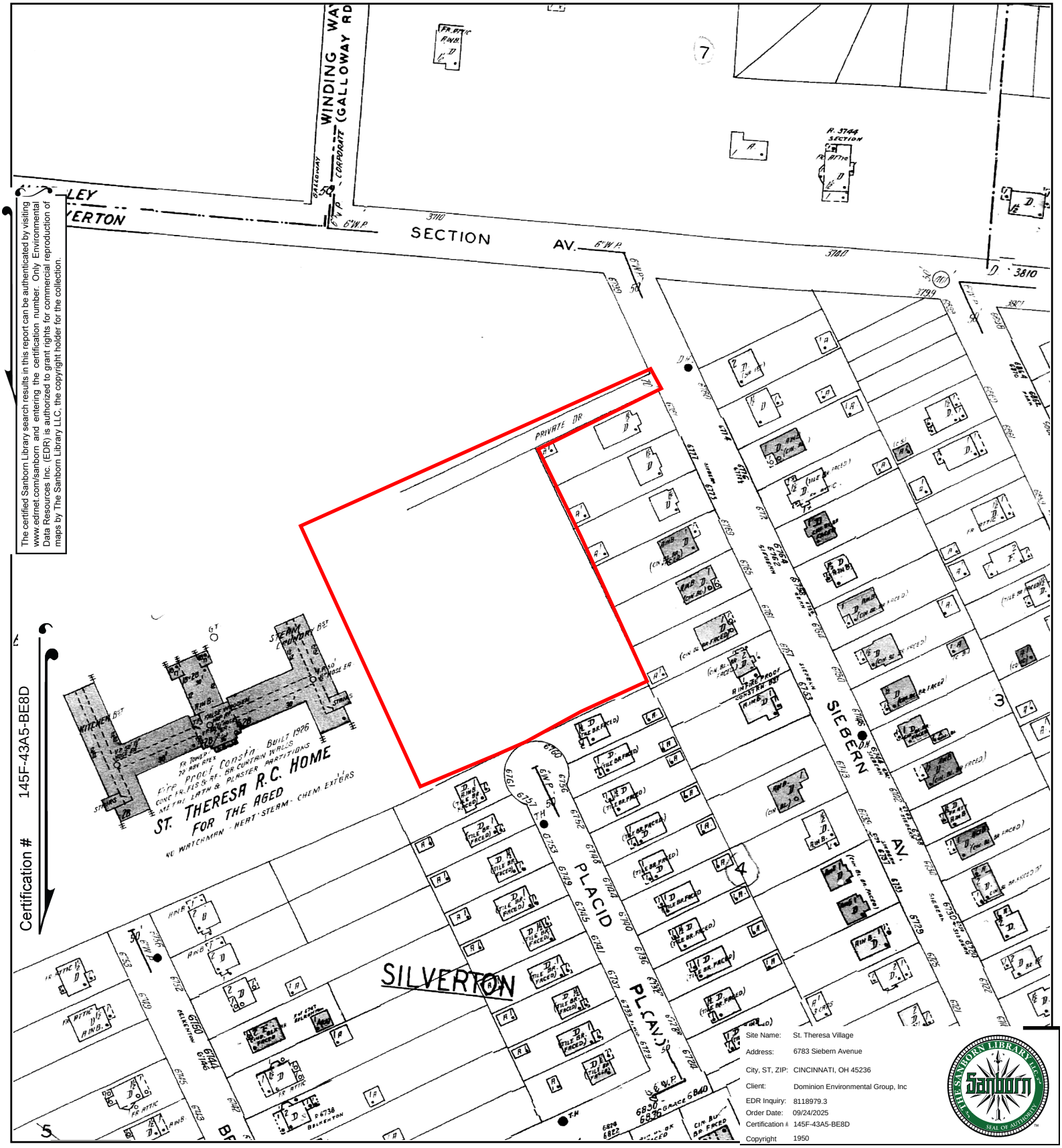

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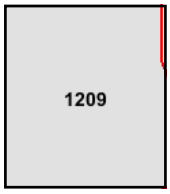

Volume 11, Sheet 1209

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Certified Sanborn® Map

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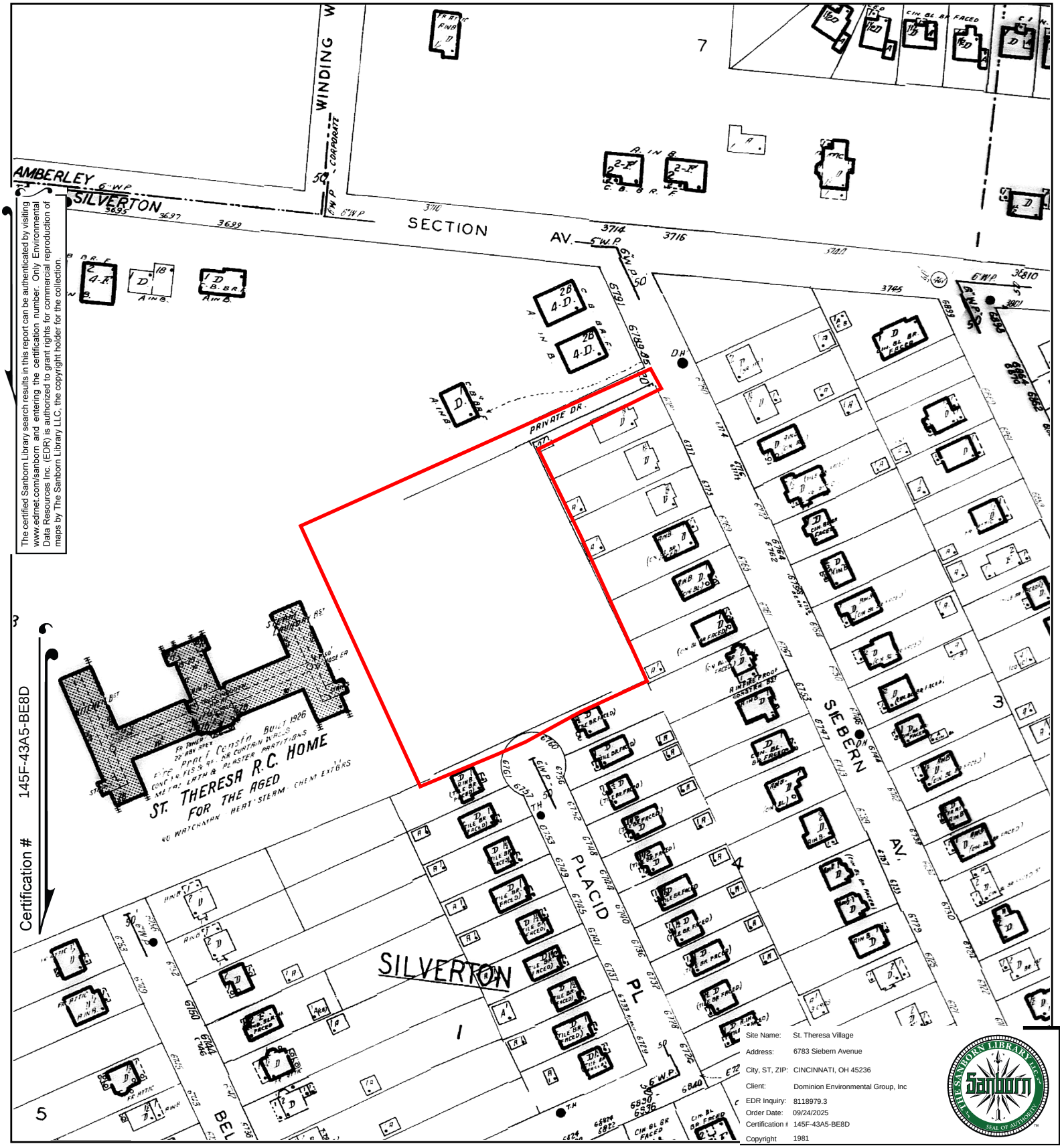

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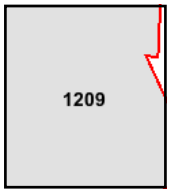

Volume 11&12, Sheet 1209

N

St. Theresa Village

6783 Siebern Avenue

CINCINNATI, OH 45236

Inquiry Number: 8118979.5

September 24, 2025

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

09/24/25

Site Name:

St. Theresa Village
6783 Siebern Avenue
CINCINNATI, OH 45236
EDR Inquiry # 8118979.5

Client Name:

Dominion Environmental Group, Inc
201 Wylderose Drive
Midlothian, VA 23113
Contact: Dana M Pelkey

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Search Results:

Year	*Scale*	*Details*	*Source*
2023	1"=500'	Flight Year: 2023	USDA/NAIP
2019	1"=500'	Flight Year: 2019	USDA/NAIP
2015	1"=500'	Flight Year: 2015	USDA/NAIP
2011	1"=500'	Flight Year: 2011	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
2001	1"=500'	Flight Year: 2001	USGS/DOQQ
1994	1"=500'	Flight Year: 1994	USGS/DOQQ
1988	1"=500'	Flight Date: April 08, 1988	NAPP
1985	1"=500'	Flight Date: March 09, 1985	USDA
1975	1"=500'	Flight Date: November 05, 1975	USDA
1970	1"=500'	Flight Date: May 19, 1970	USGS
1964	1"=500'	Flight Date: April 15, 1964	USGS
1960	1"=500'	Flight Date: April 01, 1960	USGS
1956	1"=500'	Flight Date: October 08, 1956	USDA
1951	1"=500'	Flight Date: May 01, 1951	USDA
1949	1"=500'	Flight Date: May 03, 1949	USGS
1938	1"=500'	Flight Date: September 23, 1938	USDA

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YEAR: 1938

= 500'

N

EDR

INQUIRY #: 8118979.5
YEAR: 1949
= 500'
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EDR

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YEAR: 1951

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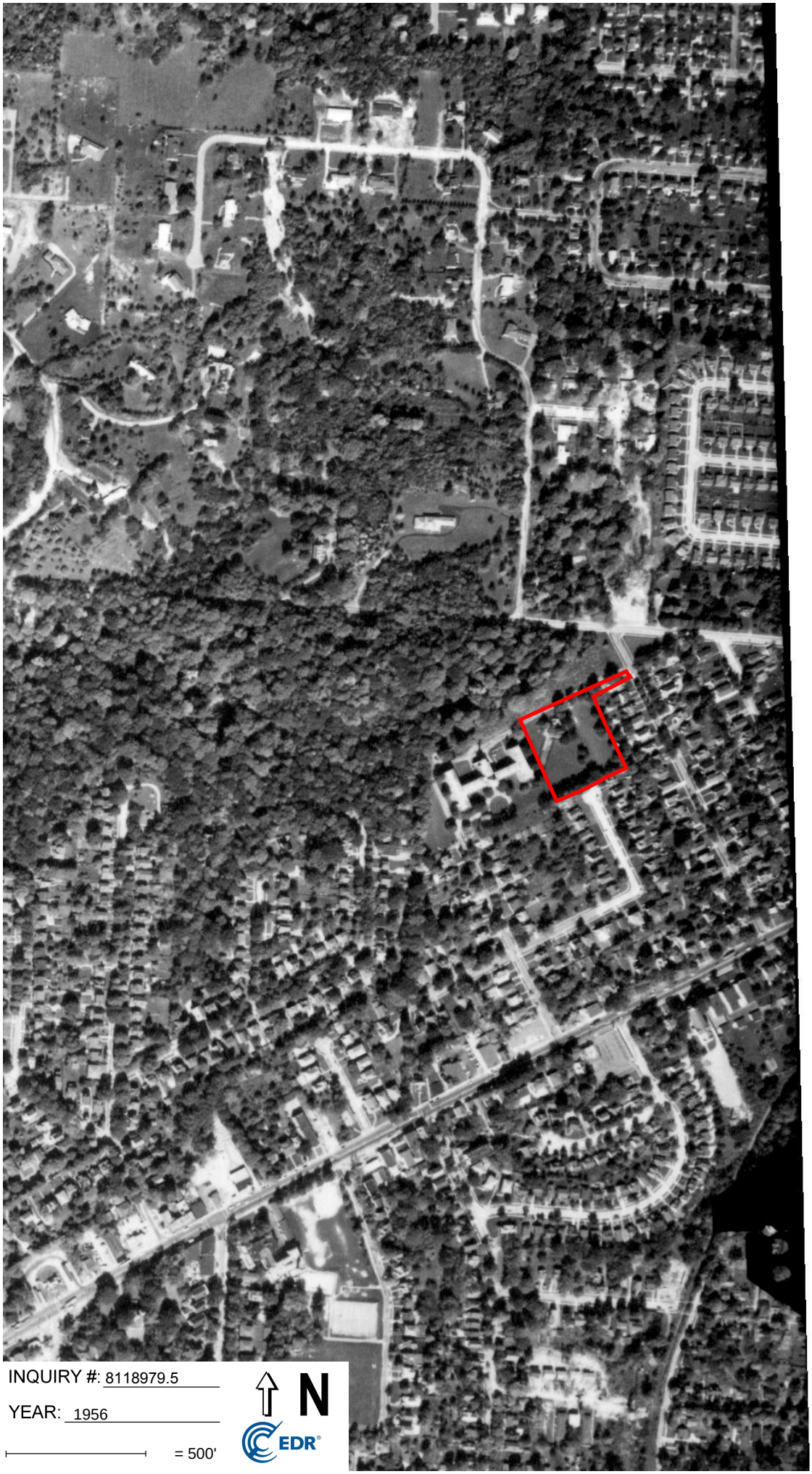
EDR



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EDR

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EDR

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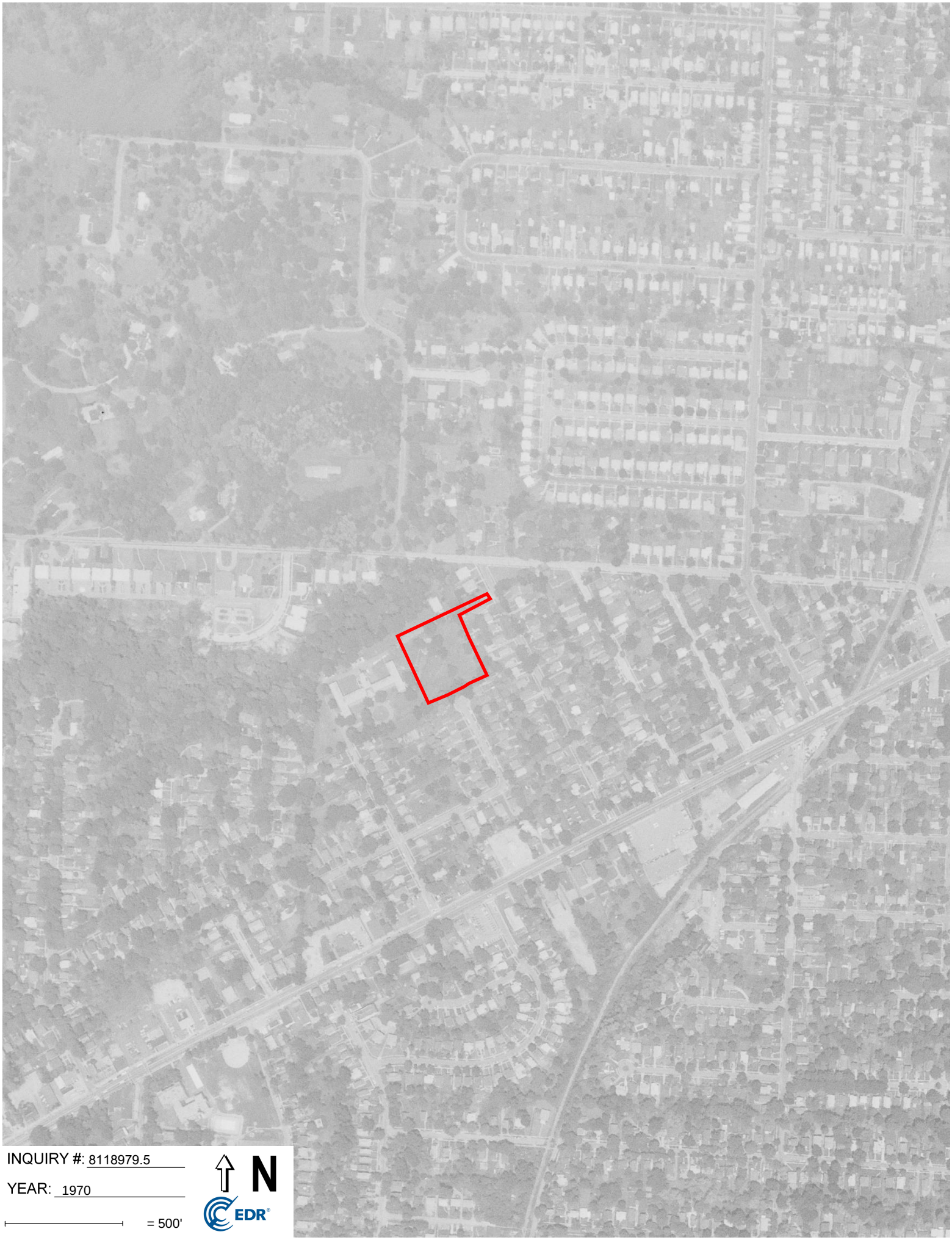
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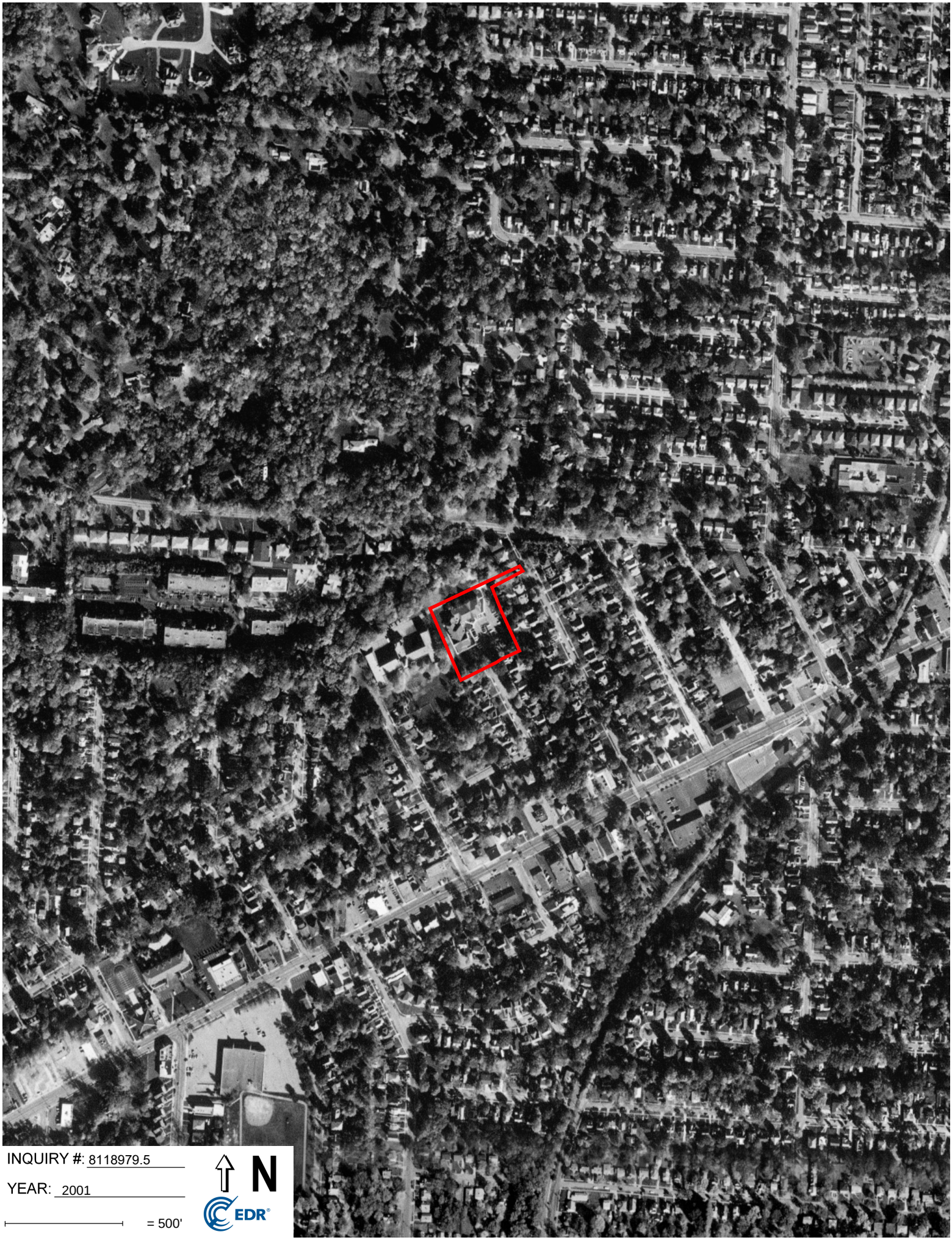
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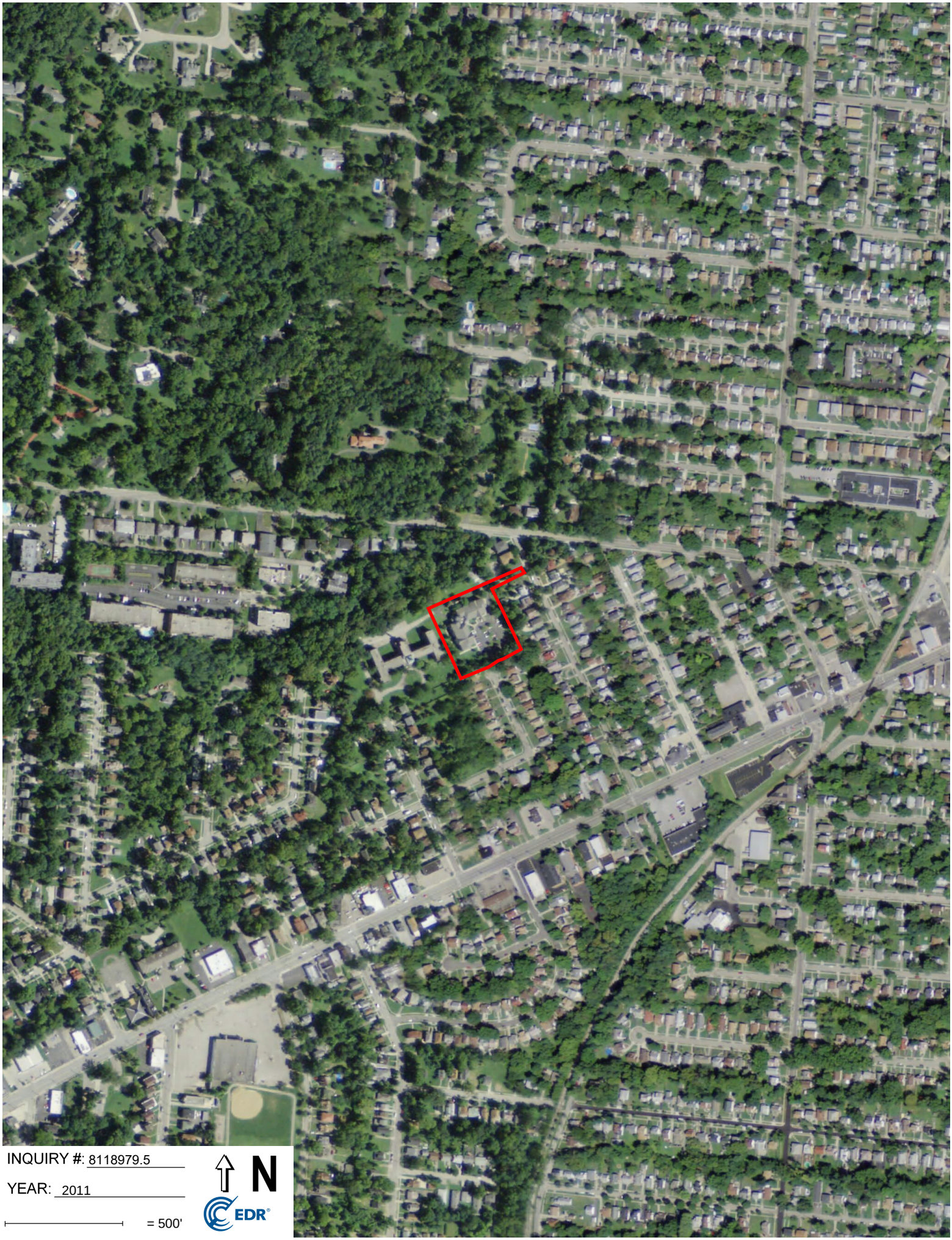

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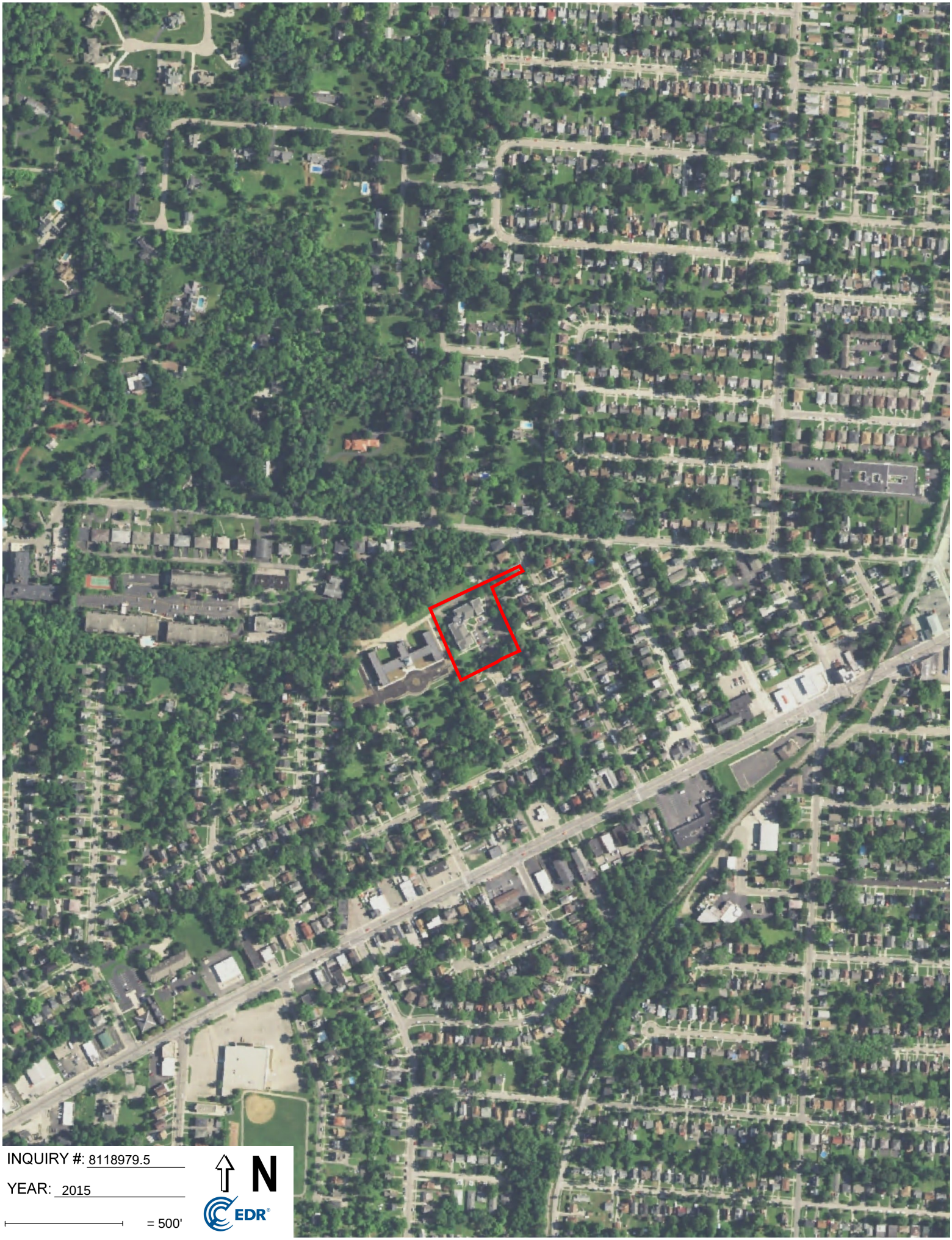
EDR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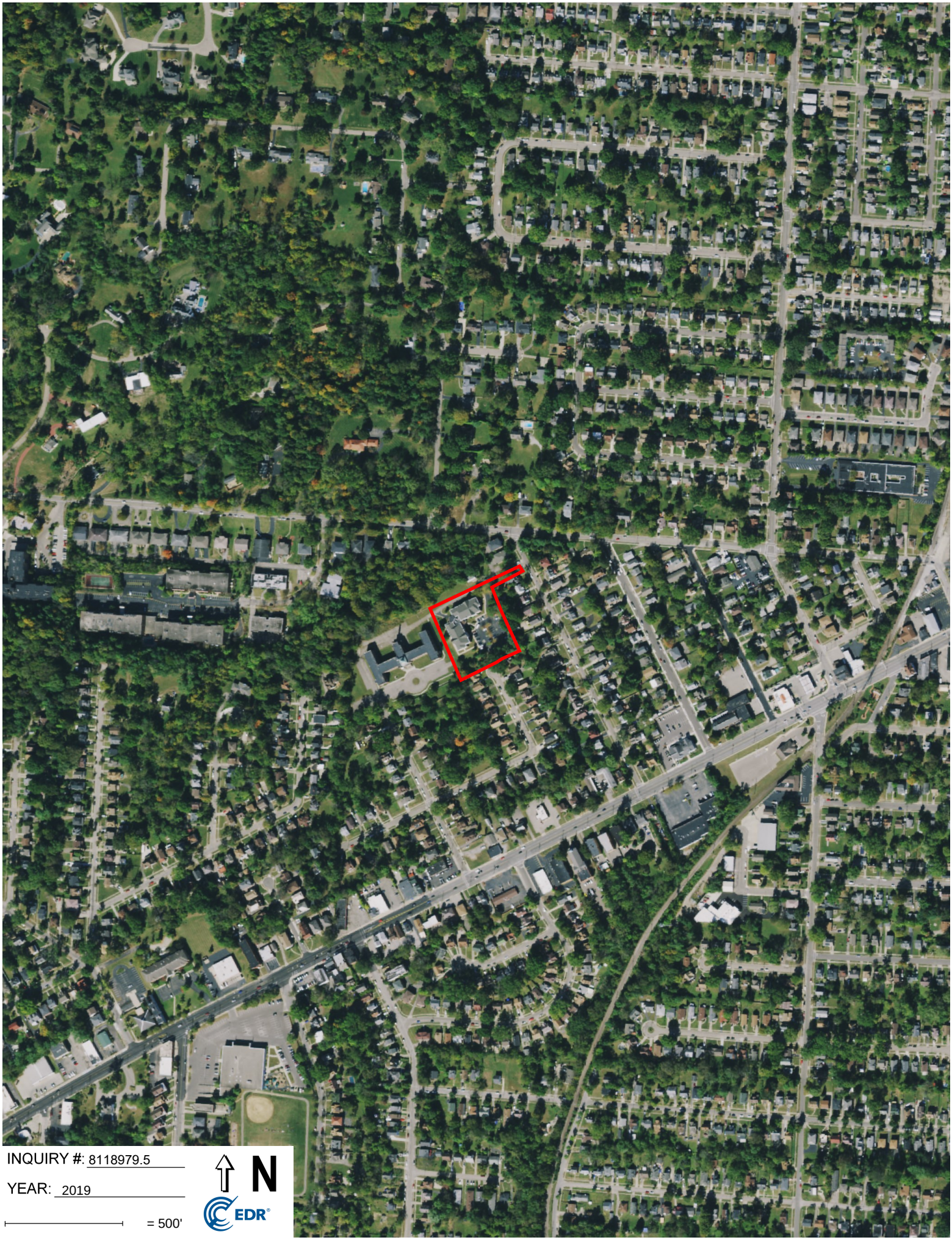
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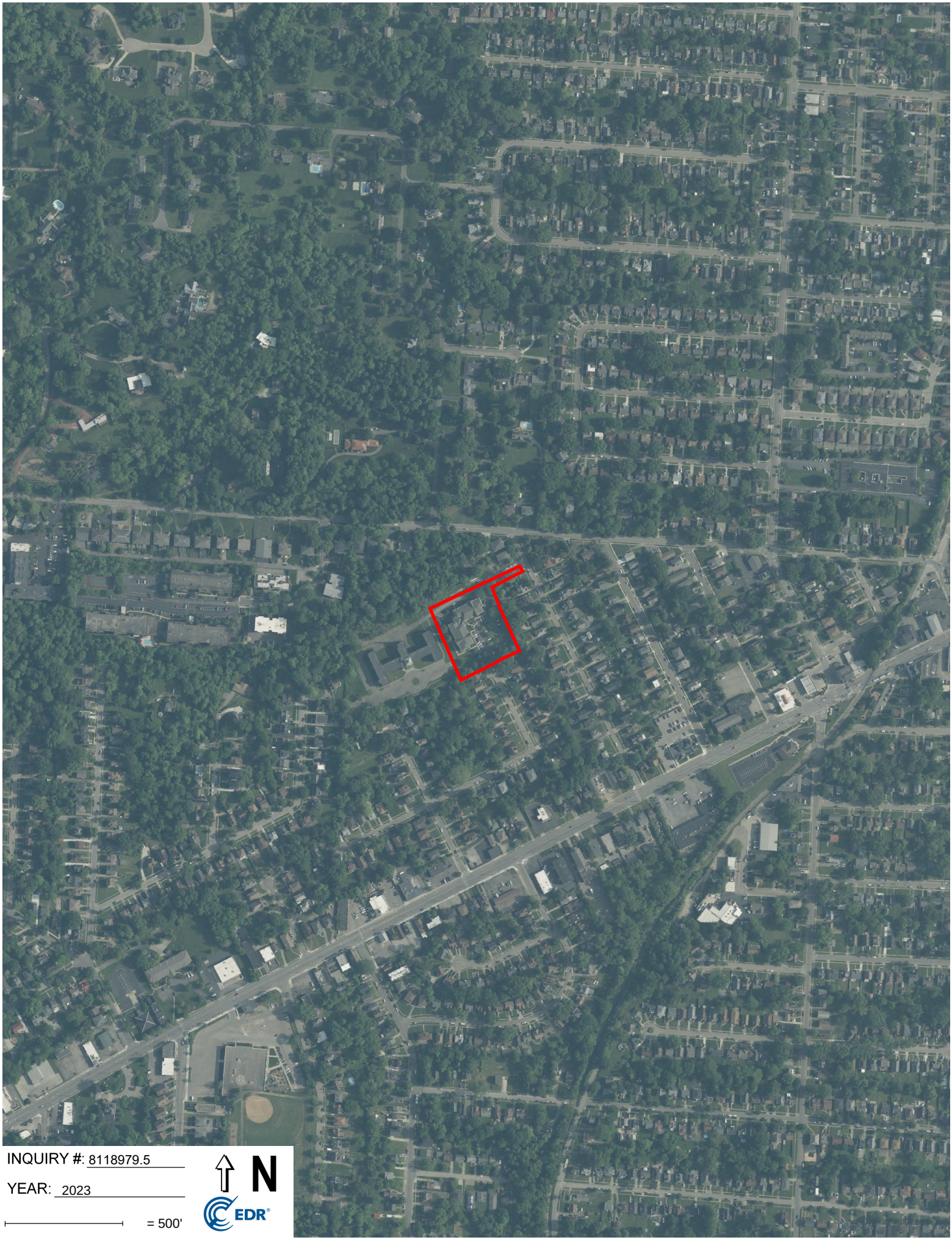

INQUIRY #: 8118979.5

YEAR: 2023

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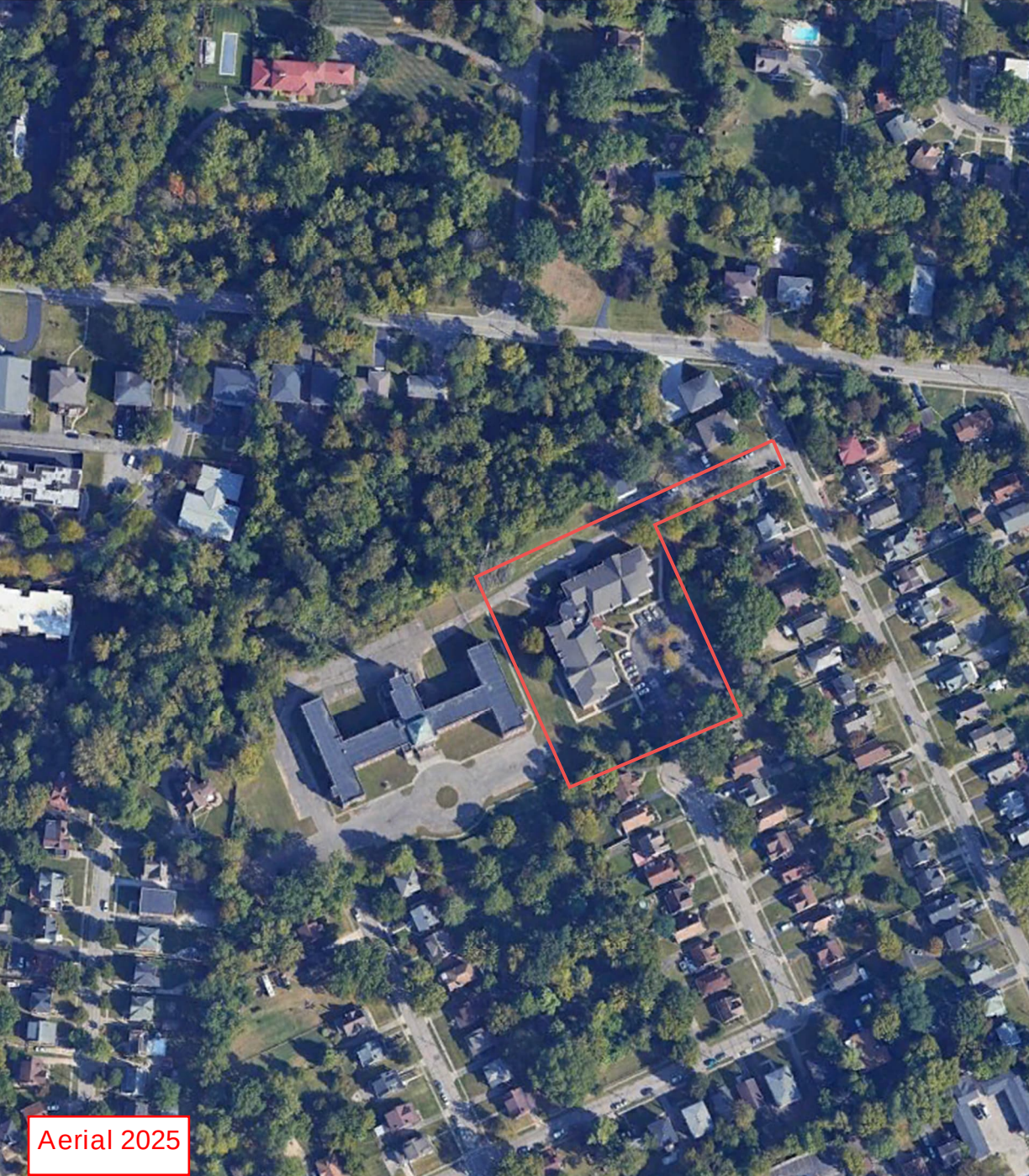
N

EDR


Aerial 2025

Appendix E:

Regulatory Records Documentation

St. Theresa Village
6783 Siebern Avenue
CINCINNATI, OH 45236

Inquiry Number: 8118979.2s
September 24, 2025

FirstSearch Report

Search Summary Report

TARGET SITE 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

Category	Sel	Site	1/8	1/4	1/2	> 1/2	ZIP	TOTALS
NPL	Y	0	0	0	0	0	0	0
NPL Delisted	Y	0	0	0	0	-	0	0
CERCLIS	Y	0	0	0	0	-	1	1
NFRAP	Y	0	0	0	0	-	0	0
RCRA COR ACT	Y	0	0	0	0	0	0	0
RCRA TSD	Y	0	0	0	0	-	0	0
RCRA GEN	Y	0	0	0	-	-	0	0
Federal IC / EC	Y	0	0	-	-	-	0	0
ERNS	Y	0	0	-	-	-	0	0
State/Tribal CERCLIS	Y	0	0	0	1	0	0	1
State/Tribal SWL	Y	0	0	0	0	0	0	0
State/Tribal LTANKS	Y	0	0	5	6	-	0	11
State/Tribal Tanks	Y	0	0	4	-	-	0	4
State/Tribal IC / EC	Y	0	0	-	-	-	0	0
State/Tribal VCP	Y	0	0	0	0	-	0	0
ST/Tribal Brownfields	Y	0	0	0	1	-	0	1
US Brownfields	Y	0	0	0	1	-	0	1
Other SWF	Y	0	0	0	0	2	0	2
Other Tanks	Y	0	0	-	-	-	0	0
Spills	Y	0	0	-	-	-	0	0
Other	Y	0	0	3	-	-	0	3
EDR Exclusive	Y	0	0	-	-	-	0	0
Exclusive Recovered Govt. Archives		0	-	-	-	-	0	0
	- Totals --	0	0	12	9	2	1	24

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

FORM-FSY-JBR

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Search Summary Report

TARGET SITE: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

Category	Database	Update	Radius	Site	1/8	1/4	1/2	> 1/2	ZIP	TOTALS
NPL	NPL	06/26/2025	1.000	0	0	0	0	0	0	0
	Proposed NPL	06/26/2025	1.000	0	0	0	0	0	0	0
	NPL LIENS	10/15/1991	TP	0	-	-	-	-	0	0
NPL Delisted	Delisted NPL	06/26/2025	0.500	0	0	0	0	-	0	0
CERCLIS	FEDERAL FACILITY	05/05/2025	0.500	0	0	0	0	-	0	0
	SEMS	06/26/2025	0.500	0	0	0	0	-	1	1
NFRAP	SEMS-ARCHIVE	06/26/2025	0.500	0	0	0	0	-	0	0
RCRA COR ACT	CORRACTS	06/02/2025	1.000	0	0	0	0	0	0	0
RCRA TSD	RCRA-TSDF	06/02/2025	0.500	0	0	0	0	-	0	0
RCRA GEN	RCRA-LQG	06/02/2025	0.250	0	0	0	-	-	0	0
	RCRA-SQG	06/02/2025	0.250	0	0	0	-	-	0	0
	RCRA-VSQG	06/02/2025	0.250	0	0	0	-	-	0	0
Federal IC / EC	LUCIS	03/11/2025	0.125	0	0	-	-	-	0	0
	US ENG CONTROLS	05/19/2025	0.125	0	0	-	-	-	0	0
	US INST CONTROLS	05/19/2025	0.125	0	0	-	-	-	0	0
ERNS	ERNS	06/10/2025	0.125	0	0	-	-	-	0	0
State/Tribal CERCLIS	SHWS		1.000	0	0	0	0	0	0	0
	DERR	03/21/2025	1.000	0	0	0	1	0	0	1
State/Tribal SWL	SWF/LF	06/30/2025	0.750	0	0	0	0	0	0	0
State/Tribal LTANKS	LUST	05/05/2025	0.500	0	0	5	6	-	0	11
	INDIAN LUST	11/18/2024	0.500	0	0	0	0	-	0	0
	UNREG LTANKS	08/25/1999	0.500	0	0	0	0	-	0	0
State/Tribal Tanks	FEMA UST	04/08/2025	0.250	0	0	0	-	-	0	0
	UST	05/05/2025	0.250	0	0	4	-	-	0	4
	AST	04/18/2025	0.250	0	0	0	-	-	0	0
	INDIAN UST	11/18/2024	0.250	0	0	0	-	-	0	0
State/Tribal IC / EC	HIST ENG CONTROLS	05/10/2005	0.125	0	0	-	-	-	0	0

Search Summary Report

TARGET SITE: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

Category	Database	Update	Radius	Site	1/8	1/4	1/2	> 1/2	ZIP	TOTALS
	HIST INST CONTROLS	05/10/2005	0.125	0	0	-	-	-	0	0
	ENG CONTROLS	03/21/2025	0.125	0	0	-	-	-	0	0
	INST CONTROL	03/21/2025	0.125	0	0	-	-	-	0	0
State/Tribal VCP	INDIAN VCP	07/27/2015	0.500	0	0	0	0	-	0	0
	VCP	03/21/2025	0.500	0	0	0	0	-	0	0
ST/Tribal Brownfields	BROWNFIELDS	06/02/2025	0.500	0	0	0	1	-	0	1
US Brownfields	US BROWNFIELDS	09/09/2024	0.500	0	0	0	1	-	0	1
Other SWF	HIST LF	09/23/2024	0.750	0	0	0	0	2	0	2
	INDIAN ODI	12/31/1998	0.500	0	0	0	0	-	0	0
	ODI	06/30/1985	0.500	0	0	0	0	-	0	0
Other Tanks	ARCHIVE UST	05/05/2025	0.125	0	0	-	-	-	0	0
Spills	SPILLS	04/21/2025	0.125	0	0	-	-	-	0	0
Other	RCRA NonGen / NLR	06/02/2025	0.250	0	0	3	-	-	0	3
	SCRD DRYCLEANERS	07/30/2021	0.125	0	0	-	-	-	0	0
	TRIS	12/31/2023	TP	0	-	-	-	-	0	0
	RADINFO	07/01/2019	TP	0	-	-	-	-	0	0
	INDIAN RESERV	12/31/2014	1.000	0	0	0	0	0	0	0
	UMTRA	05/15/2025	0.125	0	0	-	-	-	0	0
	LEAD SMELTERS	06/26/2025	TP	0	-	-	-	-	0	0
	US MINES	05/01/2025	0.125	0	0	-	-	-	0	0
	ABANDONED MINES	05/28/2025	0.125	0	0	-	-	-	0	0
	PFAS PROJECT	05/15/2024	0.250	0	0	0	-	-	0	0
	AIRS	06/09/2025	TP	0	-	-	-	-	0	0
	DRYCLEANERS	06/13/2025	0.125	0	0	-	-	-	0	0
	LEAD	06/09/2025	TP	0	-	-	-	-	0	0
	VAPOR	06/16/2020	TP	0	-	-	-	-	0	0
EDR Exclusive	EDR MGP	08/28/2009	0.125	0	0	-	-	-	0	0
	EDR Hist Auto	02/20/2007	0.125	0	0	-	-	-	0	0
	EDR Hist Cleaner	02/20/2007	0.125	0	0	-	-	-	0	0
Exclusive Recovered Govt. Archives			TP	0	-	-	-	-	0	0
	RGA LUST		TP	0	-	-	-	-	0	0
	- Totals --			0	0	12	9	2	1	24

Site Information Report

Request Date: SEPTEMBER 24, 2025 **Search Type:** COORD
Request Name: DANA M PELKEY **Job Number:** HPS-ENV1

Target Site: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

Site Location

	Degrees (Decimal)	Degrees (Min/Sec)		UTMs
Longitude:	84.408971	84.4089710 - 84˚ 24' 32.29"	Easting:	723771.4
Latitude:	39.193256	39.1932560 - 39˚ 11' 35.72"	Northing:	4341213.0
Elevation:	841 ft. above sea level		Zone:	Zone 16

Demographics

Sites: 23 **Non-Geocoded:** 1 **Population:** N/A

RADON

Federal EPA Radon Zone for HAMILTON County: 1

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 45236

Number of sites tested: 6

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	1.100 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	1.700 pCi/L	83%	17%	0%

Federal Area Radon Information for HAMILTON COUNTY, OH

Number of sites tested: 75

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	1.044 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	1.932 pCi/L	87%	13%	0%

Site Information Report

RADON

State Database: OH Radon

Radon Test Results

Zipcode	Num Tests	Maximum	Minimum	Arith Mean	Geo Mean
45236	342	87	0.1	2.56	1.54

Target Site Summary Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236 JOB: HPS-ENV1

TOTAL: 24 GEOCODED: 23 NON GEOCODED: 1

Map ID	DB Type --ID/Status	Site Name	Address	Dist/Dir	ElevDiff	Page No.

No sites found for target address

Sites Summary Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236 JOB: HPS-ENV1

TOTAL: 24 GEOCODED: 23 NON GEOCODED: 1

Map ID	DB Type --ID/Status	Site Name	Address	Dist/Dir	ElevDiff	Page No.
A1	UST --31010432 --REM - Removed	BOBBY'S AUTO	6805 MONTGOMERY RD CINCINNATI, OH 45236	0.14 South	- 18	1
A1	LUST --NFA: No Further Action	BOBBY'S AUTO	6805 MONTGOMERY RD CINCINNATI, OH 45236	0.14 South	- 18	3
A2	RCRA NonGen / NLR --OHR000143586	CAR X AUTO SERVICE #51	6725 MONTGOMERY RD CINCINNATI, OH 45236	0.15 SSW	- 22	4
A3	UST --31003510 --REM - Removed	CAR-X MUFFLER & BRAKE SHOP #35	6725 MONTGOMERY RD SILVERTON, OH 45236	0.15 SSW	- 22	12
A3	LUST --NFA: No Further Action	CAR-X MUFFLER & BRAKE SHOP #35	6725 MONTGOMERY RD SILVERTON, OH 45236	0.15 SSW	- 22	15
A4	LUST --NFA: No Further Action	OMEGA	6742 MONTGOMERY RD SILVERTON, OH 45236	0.18 South	- 11	16
5	RCRA NonGen / NLR --OHD023805898	AAMCO TRANSMISSIONS	6715 MONTGOMERY RD CINCINNATI, OH 45236	0.19 SSW	- 25	17
B6	UST --31000567 --REM - Removed --CIU - Currently In Use	UNITED DAIRY FARMERS #003	7043 MONTGOMERY RD CINCINNATI, OH 45236	0.23 ESE	- 8	21
B6	LUST --NFA: No Further Action --CSN: Closure Sampling Not Required	UNITED DAIRY FARMERS #003	7043 MONTGOMERY RD CINCINNATI, OH 45236	0.23 ESE	- 8	27
7	UST --31000738 --REM - Removed	SILVERTON PUBLIC WORKS	3869 ALTA AVE SILVERTON, OH 45236	0.24 SE	- 21	29
7	LUST --NFA: No Further Action	SILVERTON PUBLIC WORKS	3869 ALTA AVE SILVERTON, OH 45236	0.24 SE	- 21	32

Sites Summary Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

TOTAL: 24 GEOCODED: 23 NON GEOCODED: 1

Map ID	DB Type --ID/Status	Site Name	Address	Dist/Dir	ElevDiff	Page No.
B8	RCRA NonGen / NLR --OHR000037259	METRO/SORTA BOND HILL DIV	7000 HIGHLAND AVENUE CINCINNATI, OH 45236	0.25 ESE	- 14	33
9	LUST --NFA: No Further Action	BP #09321	7123-7125 MONTGOMERY RD SILVERTON, OH 45236	0.31 East	- 2	36
C10	US BROWNFIELDS	FRITZ AUTO BODY	7210 MONTGOMERY RD SILVERTON, OH 45326	0.40 East	+ 9	37
C11	BROWNFIELDS --3433	FRITZ AUTO BODY, SILVERTON	7210 MONTGOMERY RD SILVERTON, OH 45236	0.40 East	+ 9	46
C11	DERR --531003474 --SA	FRITZ AUTO BODY, SILVERTON	7210 MONTGOMERY RD SILVERTON, OH 45236	0.40 East	+ 9	47
12	LUST --NFA: No Further Action	ORPHAN TANKS	6549 MONTGOMERY ROAD CINCINNATI, OH 45213	0.41 SW	- 2	48
13	LUST --NFA: No Further Action	FORMER GULF OIL	7001 PLAINFIELD PIKE CINCINNATI, OH 45242	0.44 ENE	+ 13	49
C14	LUST --RPT: a possible incident is reported	FIRE DEPT	6860 PLAINFIELD RD SILVERTON, OH 45236	0.45 East	+ 9	50
15	LUST --NFA: No Further Action	FORMER TROLLEY TURN AROUND	6541 MONTGOMERY ROAD CINCINNATI, OH 45213	0.47 SW	- 10	51
16	LUST --CLO: Closure	PROFITTS AUTO CENTER	7028 PLAINFIELD RD SILVERTON, OH 45236	0.49 ENE	+ 17	52
D17	HIST LF	AMBERLY VILLAGE LF	, OH	0.70 WNW	- 72	53
D18	HIST LF	AMBERLY VILLAGE LANDFILL	SECTION 25 AMBERLY TOWNSHIP, OH	0.70 WNW	- 78	54

Sites Summary Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

TOTAL: 24 GEOCODED: 23 NON GEOCODED: 1

Map ID	DB Type --ID/Status	Site Name	Address	Dist/Dir	ElevDiff	Page No.
	SEMS --0510858 --OHN000510858	OPOSSUM CREEK DRUM SITE	4257 SOLDIERS HOME ROAD MORAINE, OH 45237	NON GC	N/A	N/A

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

UST

EDR ID: U004207174 **DIST/DIR:** 0.141 South **ELEVATION:** 823 **MAP ID:** A1

NAME: BOBBY'S AUTO
ADDRESS: 6805 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31010432
ID/Status: REM - Removed

UST:
Name: BOBBY'S AUTO
Address: 6805 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236
Facility Id: 31010432
Owner Name: Not reported
Owner Address: Not reported
Owner City/State/Zip: Not reported

Tank Number: T00001
Status: REM - Removed
UST Capacity: 4000
Tank Content: Gasoline
Installation Date: 01/01/1985
Construction: BM - Bare Metal
Date Last Used: 10/07/1998
Date TCL Closed: Not reported
Date Removed: 10/07/1998
CAS Number: 8006-61-9
Abandoned Approved: Not reported
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: Not reported
Construction Comments: BM - Bare Metal
Corrosion Protections: Not reported
Corrosion Protection Comments: Not reported
Primary Release Detection: AMO - Alternative Method (Other, explain)
Secondary Release Detection: Not reported
Release Detection Comments: RDTank: / RDLine:
Piping Configuration: Not reported
Piping Configuration Comments: Not reported
Piping Styles: NA - Not Applicable
Piping Constructions: OTH - Other (explain)
Piping Construction Comments: Unknown
Piping Corrosion Protections: OTH - Other (explain)
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: OTH - Other(explain)
Piping Release Detection Comments: Not reported
Spill Prevention Manholes: NP - None Present
Spill Prevention Manhole Comments: No
OverFill Prevention: Not reported
OverFill Prevention Comment: OverFill Spill: No
Comments: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

UST

EDR ID: U004207174 **DIST/DIR:** 0.141 South **ELEVATION:** 823 **MAP ID:** A1

NAME: BOBBY'S AUTO
ADDRESS: 6805 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31010432
ID/Status: REM - Removed

Name: BOBBY'S AUTO
Address: 6805 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236

Tank Number: T00002
Status: REM - Removed
UST Capacity: 4000
Tank Content: Gasoline
Installation Date: 01/01/1985
Construction: BM - Bare Metal
Date Last Used: 10/07/1998
Date TCL Closed: Not reported
Date Removed: 10/07/1998
CAS Number: 8006-61-9
Abandoned Approved: Not reported
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: Not reported
Construction Comments: BM - Bare Metal
Corrosion Protections: Not reported
Corrosion Protection Comments: Not reported
Primary Release Detection: AMO - Alternative Method (Other, explain)
Secondary Release Detection: Not reported
Release Detection Comments: RDTank: / RDLine:
Piping Configuration: Not reported
Piping Configuration Comments: Not reported
Piping Styles: NA - Not Applicable
Piping Constructions: OTH - Other (explain)
Piping Construction Comments: Unknown
Piping Corrosion Protections: OTH - Other (explain)
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: OTH - Other(explain)
Piping Release Detection Comments: Not reported
Spill Prevention Manholes: NP - None Present
Spill Prevention Manhole Comments: No
OverFill Prevention: Not reported
OverFill Prevention Comment: OverFill Spill: No
Comments: Not reported

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

LUST

EDR ID: U004207174 **DIST/DIR:** 0.141 South **ELEVATION:** 823 **MAP ID:** A1

NAME: BOBBY'S AUTO
ADDRESS: 6805 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: NFA: No Further Action

LUST:
Name: BOBBY'S AUTO
Address: 6805 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236
Release Number: 31010432 - N00001
Release Date: 12/03/1998
LTF Status: 1 SUS/CON from regulated UST
FR Status: NFA: No Further Action
Priority: 2
Review Date: 08/19/2020
Priority Decode: SUS/CON from non-regulated UST
Class1 Decode: The RP is non-viable
Latitude: 39.190535
Longitude: -84.40933
Class: Responsible Party is non-viable
Incident Number: 318200900.0
Last Update: Scott Sigler
Last Update Date: 08/19/2020
Last Update Updated: 08/19/2020
Sub Status: Approved
Rules: 2017
Coordinator: Ralph Mertz
Rating: 14

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1010566894 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A2

NAME: CAR X AUTO SERVICE #51
ADDRESS: 6725 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHR000143586

RCRA Listings:
Date Form Received by Agency: 20070508
Handler Name: Car X Auto Service #51
Handler Address: 6725 Montgomery Rd
Handler City,State,Zip: CINCINNATI, OH 45236
EPA ID: OHR000143586
Contact Name: CHRIS OSTENDORF
Contact Address: Not reported
Contact City,State,Zip: Not reported
Contact Telephone: 513-793-8642
Contact Fax: Not reported
Contact Email: Not reported
Contact Title: Not reported
EPA Region: 05
Land Type: Private
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: State-specific Activities
State District Owner: Oh
State District: SW
Mailing Address: Not reported
Mailing City,State,Zip: Not reported
Owner Name: Absco Investments
Owner Type: Private
Operator Name: Car X Auto Service
Operator Type: Private
Short-Term Generator Activity: No
Importer Activity: No
Mixed Waste Generator: No
Transporter Activity: No
Transfer Facility Activity: No
Recycler Activity with Storage: No
Small Quantity On-Site Burner Exemption: No
Smelting Melting and Refining Furnace Exemption: No
Underground Injection Control: No
Off-Site Waste Receipt: No
Universal Waste Indicator: No
Universal Waste Destination Facility: No
Federal Universal Waste: No
Active Site State-Reg Handler: --Y
Federal Facility Indicator: Not reported
Hazardous Secondary Material Indicator: N

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1010566894 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A2

NAME: CAR X AUTO SERVICE #51
ADDRESS: 6725 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHR000143586

Sub-Part K Indicator: Not reported
2018 GPRA Permit Baseline: Not on the Baseline
2018 GPRA Renewals Baseline: Not on the Baseline
202 GPRA Corrective Action Baseline: No
Subject to Corrective Action Universe: No
Non-TSDFs Where RCRA CA has Been Imposed Universe: No
Corrective Action Priority Ranking: No NCAPS ranking
Environmental Control Indicator: No
Institutional Control Indicator: No
Human Exposure Controls Indicator: N/A
Groundwater Controls Indicator: N/A
Significant Non-Complier Universe: No
Unaddressed Significant Non-Complier Universe: No
Addressed Significant Non-Complier Universe: No
Significant Non-Complier With a Compliance Schedule Universe: No
Financial Assurance Required: Not reported
Handler Date of Last Change: 20150428
Recognized Trader-Importer: No
Recognized Trader-Exporter: No
Importer of Spent Lead Acid Batteries: No
Exporter of Spent Lead Acid Batteries: No
Recycler Activity Without Storage: No
Manifest Broker: No
Sub-Part P Indicator: No

Handler - Owner Operator:
Owner/Operator Indicator: Operator
Owner/Operator Name: CAR X AUTO SERVICE
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 11843 KEMPER SPRINGS DR
Owner/Operator City,State,Zip: CINCINNATI, OH 45240
Owner/Operator Telephone: 513-825-2660
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: ABSCO INVESTMENTS
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1010566894 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A2

NAME: CAR X AUTO SERVICE #51
ADDRESS: 6725 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHR000143586

Owner/Operator Address: 6676 N LINCOLN AVE
Owner/Operator City,State,Zip: LINCOLNWOOD, IL 60712
Owner/Operator Telephone: Not reported
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20070508
Handler Name: CAR X AUTO SERVICE #51
Federal Waste Generator Description: Not a generator, verified
State District Owner: Oh
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Codes: No NAICS Codes Found

Has the Facility Received Notices of Violations:
Found Violation: No
Agency Which Determined Violation: Not reported
Violation Short Description: Not reported
Date Violation was Determined: Not reported
Actual Return to Compliance Date: Not reported
Return to Compliance Qualifier: Not reported
Violation Responsible Agency: Not reported
Scheduled Compliance Date: Not reported
Enforcement Identifier: Not reported
Date of Enforcement Action: Not reported
Enforcement Responsible Agency: Not reported
Enforcement Docket Number: Not reported
Enforcement Attorney: Not reported
Corrective Action Component: Not reported
Appeal Initiated Date: Not reported
Appeal Resolution Date: Not reported
Disposition Status Date: Not reported
Disposition Status: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1010566894 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A2

NAME: CAR X AUTO SERVICE #51
ADDRESS: 6725 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHR000143586

Disposition Status Description: Not reported
Consent/Final Order Sequence Number: Not reported
Consent/Final Order Respondent Name: Not reported
Consent/Final Order Lead Agency: Not reported
Enforcement Type: Not reported
Enforcement Responsible Person: Not reported
Enforcement Responsible Sub-Organization: Not reported
SEP Sequence Number: Not reported
SEP Expenditure Amount: Not reported
SEP Scheduled Completion Date: Not reported
SEP Actual Date: Not reported
SEP Defaulted Date: Not reported
SEP Type: Not reported
SEP Type Description: Not reported
Proposed Amount: Not reported
Final Monetary Amount: Not reported
Paid Amount: Not reported
Final Count: Not reported
Final Amount: Not reported

Found Violation: Yes
Agency Which Determined Violation: State
Violation Short Description: Used Oil - Generators
Date Violation was Determined: 20070508
Actual Return to Compliance Date: 20071024
Return to Compliance Qualifier: Documented
Violation Responsible Agency: State
Scheduled Compliance Date: Not reported
Enforcement Identifier: 001
Date of Enforcement Action: 20070514
Enforcement Responsible Agency: State
Enforcement Docket Number: Not reported
Enforcement Attorney: Not reported
Corrective Action Component: No
Appeal Initiated Date: Not reported
Appeal Resolution Date: Not reported
Disposition Status Date: Not reported
Disposition Status: Not reported
Disposition Status Description: Not reported
Consent/Final Order Sequence Number: Not reported
Consent/Final Order Respondent Name: Not reported
Consent/Final Order Lead Agency: Not reported
Enforcement Type: WRITTEN INFORMAL
Enforcement Responsible Person: SROT
Enforcement Responsible Sub-Organization: SW

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1010566894 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A2

NAME: CAR X AUTO SERVICE #51
ADDRESS: 6725 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHR000143586

SEP Sequence Number: Not reported
SEP Expenditure Amount: Not reported
SEP Scheduled Completion Date: Not reported
SEP Actual Date: Not reported
SEP Defaulted Date: Not reported
SEP Type: Not reported
SEP Type Description: Not reported
Proposed Amount: Not reported
Final Monetary Amount: Not reported
Paid Amount: Not reported
Final Count: Not reported
Final Amount: Not reported

Found Violation: Yes
Agency Which Determined Violation: State
Violation Short Description: Used Oil - Generators
Date Violation was Determined: 20070508
Actual Return to Compliance Date: 20070727
Return to Compliance Qualifier: Observed
Violation Responsible Agency: State
Scheduled Compliance Date: Not reported
Enforcement Identifier: 001
Date of Enforcement Action: 20070514
Enforcement Responsible Agency: State
Enforcement Docket Number: Not reported
Enforcement Attorney: Not reported
Corrective Action Component: No
Appeal Initiated Date: Not reported
Appeal Resolution Date: Not reported
Disposition Status Date: Not reported
Disposition Status: Not reported
Disposition Status Description: Not reported
Consent/Final Order Sequence Number: Not reported
Consent/Final Order Respondent Name: Not reported
Consent/Final Order Lead Agency: Not reported
Enforcement Type: WRITTEN INFORMAL
Enforcement Responsible Person: SROT
Enforcement Responsible Sub-Organization: SW
SEP Sequence Number: Not reported
SEP Expenditure Amount: Not reported
SEP Scheduled Completion Date: Not reported
SEP Actual Date: Not reported
SEP Defaulted Date: Not reported
SEP Type: Not reported
SEP Type Description: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1010566894 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A2

NAME: CAR X AUTO SERVICE #51
ADDRESS: 6725 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHR000143586

Proposed Amount: Not reported
Final Monetary Amount: Not reported
Paid Amount: Not reported
Final Count: Not reported
Final Amount: Not reported

Found Violation: Yes
Agency Which Determined Violation: State
Violation Short Description: Used Oil - Generators
Date Violation was Determined: 20070508
Actual Return to Compliance Date: 20071024
Return to Compliance Qualifier: Documented
Violation Responsible Agency: State
Scheduled Compliance Date: Not reported
Enforcement Identifier: 001
Date of Enforcement Action: 20070514
Enforcement Responsible Agency: State
Enforcement Docket Number: Not reported
Enforcement Attorney: Not reported
Corrective Action Component: No
Appeal Initiated Date: Not reported
Appeal Resolution Date: Not reported
Disposition Status Date: Not reported
Disposition Status: Not reported
Disposition Status Description: Not reported
Consent/Final Order Sequence Number: Not reported
Consent/Final Order Respondent Name: Not reported
Consent/Final Order Lead Agency: Not reported
Enforcement Type: WRITTEN INFORMAL
Enforcement Responsible Person: SROT
Enforcement Responsible Sub-Organization: SW
SEP Sequence Number: Not reported
SEP Expenditure Amount: Not reported
SEP Scheduled Completion Date: Not reported
SEP Actual Date: Not reported
SEP Defaulted Date: Not reported
SEP Type: Not reported
SEP Type Description: Not reported
Proposed Amount: Not reported
Final Monetary Amount: Not reported
Paid Amount: Not reported
Final Count: Not reported
Final Amount: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1010566894 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A2

NAME: CAR X AUTO SERVICE #51
ADDRESS: 6725 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHR000143586

Evaluation Action Summary:
Evaluation Date: 20071024
Evaluation Responsible Agency: State
Found Violation: No
Evaluation Type Description: NON-FINANCIAL RECORD REVIEW
Evaluation Responsible Person Identifier: SROT
Evaluation Responsible Sub-Organization: SW
Actual Return to Compliance Date: Not reported
Scheduled Compliance Date: Not reported
Date of Request: Not reported
Date Response Received: Not reported
Request Agency: Not reported
Former Citation: Not reported

Evaluation Date: 20070719
Evaluation Responsible Agency: State
Found Violation: Yes
Evaluation Type Description: FOLLOW-UP INSPECTION
Evaluation Responsible Person Identifier: SROT
Evaluation Responsible Sub-Organization: SW
Actual Return to Compliance Date: 20071024
Scheduled Compliance Date: Not reported
Date of Request: Not reported
Date Response Received: Not reported
Request Agency: Not reported
Former Citation: Not reported

Evaluation Date: 20070508
Evaluation Responsible Agency: State
Found Violation: Yes
Evaluation Type Description: FOCUSED COMPLIANCE INSPECTION
Evaluation Responsible Person Identifier: SROT
Evaluation Responsible Sub-Organization: SW
Actual Return to Compliance Date: 20070727
Scheduled Compliance Date: Not reported
Date of Request: Not reported
Date Response Received: Not reported
Request Agency: Not reported
Former Citation: Not reported

Evaluation Date: 20070508
Evaluation Responsible Agency: State
Found Violation: Yes
Evaluation Type Description: FOCUSED COMPLIANCE INSPECTION

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1010566894 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A2

NAME: CAR X AUTO SERVICE #51
ADDRESS: 6725 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHR000143586

Evaluation Responsible Person Identifier: SROT
Evaluation Responsible Sub-Organization: SW
Actual Return to Compliance Date: 20071024
Scheduled Compliance Date: Not reported
Date of Request: Not reported
Date Response Received: Not reported
Request Agency: Not reported
Former Citation: Not reported

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

UST

EDR ID: U004218297 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A3

NAME: CAR-X MUFFLER & BRAKE SHOP #3506
ADDRESS: 6725 MONTGOMERY RD
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31003510
ID/Status: REM - Removed

UST:
Name: CAR-X MUFFLER & BRAKE SHOP #3506
Address: 6725 MONTGOMERY RD
City,State,Zip: SILVERTON, OH 45236
Facility Id: 31003510
Owner Name: Not reported
Owner Address: Not reported
Owner City/State/Zip: Not reported

Tank Number: T00001
Status: REM - Removed
UST Capacity: 4000
Tank Content: Gasoline
Installation Date: Not reported
Construction: Not reported
Date Last Used: Not reported
Date TCL Closed: Not reported
Date Removed: 04/15/1997
CAS Number: Not reported
Abandoned Approved: Yes
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: Not reported
Construction Comments: Not reported
Corrosion Protections: Not reported
Corrosion Protection Comments: Not reported
Primary Release Detection: AMO - Alternative Method (Other, explain)
Secondary Release Detection: Not reported
Release Detection Comments: RDTank: / RDLine:
Piping Configuration: Not reported
Piping Configuration Comments: Not reported
Piping Styles: NA - Not Applicable
Piping Constructions: OTH - Other (explain)
Piping Construction Comments: Not reported
Piping Corrosion Protections: OTH - Other (explain)
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: OTH - Other(explain)
Piping Release Detection Comments: Not reported
Spill Prevention Manholes: NP - None Present
Spill Prevention Manhole Comments: No
OverFill Prevention: Not reported
OverFill Prevention Comment: OverFill Spill: No
Comments: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

UST

EDR ID: U004218297 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A3

NAME: CAR-X MUFFLER & BRAKE SHOP #3506
ADDRESS: 6725 MONTGOMERY RD
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31003510
ID/Status: REM - Removed

Name: CAR-X MUFFLER & BRAKE SHOP #3506
Address: 6725 MONTGOMERY RD
City,State,Zip: SILVERTON, OH 45236

Tank Number: T00002
Status: REM - Removed
UST Capacity: 4000
Tank Content: Gasoline
Installation Date: Not reported
Construction: Not reported
Date Last Used: Not reported
Date TCL Closed: Not reported
Date Removed: 04/15/1997
CAS Number: Not reported
Abandoned Approved: Yes
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: Not reported
Construction Comments: Not reported
Corrosion Protections: Not reported
Corrosion Protection Comments: Not reported
Primary Release Detection: AMO - Alternative Method (Other, explain)
Secondary Release Detection: Not reported
Release Detection Comments: RDTank: / RDLine:
Piping Configuration: Not reported
Piping Configuration Comments: Not reported
Piping Styles: NA - Not Applicable
Piping Constructions: OTH - Other (explain)
Piping Construction Comments: Not reported
Piping Corrosion Protections: OTH - Other (explain)
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: OTH - Other(explain)
Piping Release Detection Comments: Not reported
Spill Prevention Manholes: NP - None Present
Spill Prevention Manhole Comments: No
OverFill Prevention: Not reported
OverFill Prevention Comment: OverFill Spill: No
Comments: Not reported

Name: CAR-X MUFFLER & BRAKE SHOP #3506
Address: 6725 MONTGOMERY RD
City,State,Zip: SILVERTON, OH 45236

Tank Number: T00003

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

UST

EDR ID: U004218297 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A3

NAME: CAR-X MUFFLER & BRAKE SHOP #3506
ADDRESS: 6725 MONTGOMERY RD
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31003510
ID/Status: REM - Removed

Status: REM - Removed
UST Capacity: 10000
Tank Content: Gasoline
Installation Date: Not reported
Construction: Not reported
Date Last Used: Not reported
Date TCL Closed: Not reported
Date Removed: 04/15/1997
CAS Number: Not reported
Abandoned Approved: Yes
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: Not reported
Construction Comments: Not reported
Corrosion Protections: Not reported
Corrosion Protection Comments: Not reported
Primary Release Detection: AMO - Alternative Method (Other, explain)
Secondary Release Detection: Not reported
Release Detection Comments: RDTank: / RDLine:
Piping Configuration: Not reported
Piping Configuration Comments: Not reported
Piping Styles: NA - Not Applicable
Piping Constructions: OTH - Other (explain)
Piping Construction Comments: Not reported
Piping Corrosion Protections: OTH - Other (explain)
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: OTH - Other(explain)
Piping Release Detection Comments: Not reported
Spill Prevention Manholes: NP - None Present
Spill Prevention Manhole Comments: No
OverFill Prevention: Not reported
OverFill Prevention Comment: OverFill Spill: No
Comments: Not reported

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

LUST

EDR ID: U004218297 **DIST/DIR:** 0.154 SSW **ELEVATION:** 819 **MAP ID:** A3

NAME: CAR-X MUFFLER & BRAKE SHOP #3506
ADDRESS: 6725 MONTGOMERY RD
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: NFA: No Further Action

LUST:
Name: CAR-X MUFFLER & BRAKE SHOP #3506
Address: 6725 MONTGOMERY RD
City,State,Zip: SILVERTON, OH 45236
Release Number: 31003510 - N00001
Release Date: 04/15/1997
LTF Status: 6 Closure of regulated UST
FR Status: NFA: No Further Action
Priority: Not reported
Review Date: 09/04/1997
Priority Decode: Not reported
Class1 Decode: A viable RP have been identified
Latitude: 39.190194
Longitude: -84.410128
Class: Viable Responsible Party has been identified
Incident Number: 317020700.0
Last Update: Ryan Siath
Last Update Date: 03/01/2024
Last Update Updated: 03/10/2004
Sub Status: Not reported
Rules: 1992
Coordinator: Not reported
Rating: 5

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

LUST

EDR ID: U004098110 **DIST/DIR:** 0.180 South **ELEVATION:** 830 **MAP ID:** A4

NAME: OMEGA
ADDRESS: 6742 MONTGOMERY RD
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: NFA: No Further Action

LUST:
Name: OMEGA
Address: 6742 MONTGOMERY RD
City,State,Zip: SILVERTON, OH 45236
Release Number: 31010325 - N00001
Release Date: 05/27/1988
LTF Status: 1 SUS/CON from regulated UST
FR Status: NFA: No Further Action
Priority: 2
Review Date: 03/09/1992
Priority Decode: SUS/CON from non-regulated UST
Class1 Decode: A viable RP have been identified
Latitude: 39.190221
Longitude: -84.409162
Class: Viable Responsible Party has been identified
Incident Number: 31816200.0
Last Update: Ryan Siath
Last Update Date: 05/21/2024
Last Update Updated: Not reported
Sub Status: Not reported
Rules: 1992
Coordinator: Not reported
Rating: 6

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1000177998 **DIST/DIR:** 0.192 SSW **ELEVATION:** 816 **MAP ID:** 5

NAME: AAMCO TRANSMISSIONS
ADDRESS: 6715 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHD023805898

RCRA Listings:
Date Form Received by Agency: 20200706
Handler Name: Aamco Transmissions
Handler Address: 6715 Montgomery Rd
Handler City,State,Zip: CINCINNATI, OH 45236
EPA ID: OHD023805898
Contact Name: Not reported
Contact Address: Not reported
Contact City,State,Zip: Not reported
Contact Telephone: Not reported
Contact Fax: Not reported
Contact Email: Not reported
Contact Title: Not reported
EPA Region: 05
Land Type: Not reported
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: Not reported
State District Owner: Oh
State District: SW
Mailing Address: Not reported
Mailing City,State,Zip: Not reported
Owner Name: Not reported
Owner Type: Not reported
Operator Name: Not reported
Operator Type: Not reported
Short-Term Generator Activity: No
Importer Activity: No
Mixed Waste Generator: No
Transporter Activity: No
Transfer Facility Activity: No
Recycler Activity with Storage: No
Small Quantity On-Site Burner Exemption: No
Smelting Melting and Refining Furnace Exemption: No
Underground Injection Control: No
Off-Site Waste Receipt: No
Universal Waste Indicator: No
Universal Waste Destination Facility: No
Federal Universal Waste: No
Active Site State-Reg Handler: ---
Federal Facility Indicator: Not reported
Hazardous Secondary Material Indicator: N

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1000177998 **DIST/DIR:** 0.192 SSW **ELEVATION:** 816 **MAP ID:** 5

NAME: AAMCO TRANSMISSIONS
ADDRESS: 6715 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHD023805898

Sub-Part K Indicator: Not reported
2018 GPRA Permit Baseline: Not on the Baseline
2018 GPRA Renewals Baseline: Not on the Baseline
202 GPRA Corrective Action Baseline: No
Subject to Corrective Action Universe: No
Non-TSDFs Where RCRA CA has Been Imposed Universe: No
Corrective Action Priority Ranking: No NCAPS ranking
Environmental Control Indicator: No
Institutional Control Indicator: No
Human Exposure Controls Indicator: N/A
Groundwater Controls Indicator: N/A
Significant Non-Complier Universe: No
Unaddressed Significant Non-Complier Universe: No
Addressed Significant Non-Complier Universe: No
Significant Non-Complier With a Compliance Schedule Universe: No
Financial Assurance Required: Not reported
Handler Date of Last Change: 20200706
Recognized Trader-Importer: No
Recognized Trader-Exporter: No
Importer of Spent Lead Acid Batteries: No
Exporter of Spent Lead Acid Batteries: No
Recycler Activity Without Storage: No
Manifest Broker: No
Sub-Part P Indicator: No

Hazardous Waste Summary:
Waste Code: D001
Waste Description: Ignitable Waste

Waste Code: D002
Waste Description: Corrosive Waste

Handler - Owner Operator:
Owner/Operator Indicator: Owner
Owner/Operator Name: LONG DAN
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: ADDRESS NOT REPORTED
Owner/Operator City,State,Zip: CITY NOT REPORTED, AK 99998
Owner/Operator Telephone: 312-555-1212
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported

- Continued on next page -

RCRA NonGen / NLR

EDR ID: 1000177998 **DIST/DIR:** 0.192 SSW **ELEVATION:** 816 **MAP ID:** 5

NAME: AAMCO TRANSMISSIONS
ADDRESS: 6715 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHD023805898

Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator
Owner/Operator Name: NAME NOT REPORTED
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: ADDRESS NOT REPORTED
Owner/Operator City,State,Zip: CITY NOT REPORTED, AK 99998
Owner/Operator Telephone: 312-555-1212
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20200706
Handler Name: AAMCO TRANSMISSIONS
Federal Waste Generator Description: Not a generator, verified
State District Owner: Oh
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

Receive Date: 19861209
Handler Name: AAMCO TRANSMISSIONS
Federal Waste Generator Description: Small Quantity Generator
State District Owner: Oh
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: No
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Codes: No NAICS Codes Found

- Continued on next page -

RCRA NonGen / NLR

EDR ID: 1000177998 **DIST/DIR:** 0.192 SSW **ELEVATION:** 816 **MAP ID:** 5

NAME: AAMCO TRANSMISSIONS
ADDRESS: 6715 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHD023805898

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

UST

EDR ID: U000686858 **DIST/DIR:** 0.229 ESE **ELEVATION:** 833 **MAP ID:** B6

NAME: UNITED DAIRY FARMERS #003
ADDRESS: 7043 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31000567
ID/Status: REM - Removed
ID/Status: CIU - Currently In Use

UST:
Name: UNITED DAIRY FARMERS #003
Address: 7043 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236
Facility Id: 31000567
Owner Name: UNITED DAIRY FARMERS
Owner Address: 3955 MONTGOMERY RD
Owner City/State/Zip: 45212

Tank Number: T00001
Status: REM - Removed
UST Capacity: 10000
Tank Content: Gasoline
Installation Date: 04/01/1986
Construction: FRP-Fiberglass Reinforced Plastic
Date Last Used: Not reported
Date TCL Closed: Not reported
Date Removed: 09/10/2014
CAS Number: 8006-61-9
Abandoned Approved: Not reported
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: SW - Single Wall
Construction Comments: Not reported
Corrosion Protections: NR - None Required by Rule
Corrosion Protection Comments: Not reported
Primary Release Detection: ATG - Automatic Tank Gauging
Secondary Release Detection: ATG - Automatic Tank Gauging
Release Detection Comments: Not reported
Piping Configuration: SW - Single Wall
Piping Configuration Comments: Not reported
Piping Styles: P - Pressure
Piping Constructions: FRP - Fiberglass Reinforced Plastic
Piping Construction Comments: Not reported
Piping Corrosion Protections: NR - None required by rule
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: ELLD - Electronic Line Leak Detector
Piping Release Detection Comments: Not reported
Spill Prevention Manholes: SB - Spill Containment Manhole (bucket)
Spill Prevention Manhole Comments: Not reported
OverFill Prevention: FILL - Fill Pipe (drop tube flapper)
OverFill Prevention Comment: Not reported
Comments: Not reported

- Continued on next page -

UST

EDR ID: U000686858 **DIST/DIR:** 0.229 ESE **ELEVATION:** 833 **MAP ID:** B6

NAME: UNITED DAIRY FARMERS #003
ADDRESS: 7043 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31000567
ID/Status: REM - Removed
ID/Status: CIU - Currently In Use

Name: UNITED DAIRY FARMERS #003
Address: 7043 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236

Tank Number: T00002
Status: REM - Removed
UST Capacity: 10000
Tank Content: Gasoline
Installation Date: 04/01/1986
Construction: FRP-Fiberglass Reinforced Plastic
Date Last Used: Not reported
Date TCL Closed: Not reported
Date Removed: 09/10/2014
CAS Number: 8006-61-9
Abandoned Approved: Not reported
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: SW - Single Wall
Construction Comments: Not reported
Corrosion Protections: NR - None Required by Rule
Corrosion Protection Comments: Not reported
Primary Release Detection: ATG - Automatic Tank Gauging
Secondary Release Detection: ATG - Automatic Tank Gauging
Release Detection Comments: Not reported
Piping Configuration: SW - Single Wall
Piping Configuration Comments: Not reported
Piping Styles: P - Pressure
Piping Constructions: FRP - Fiberglass Reinforced Plastic
Piping Construction Comments: Not reported
Piping Corrosion Protections: NR - None required by rule
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: ELLD - Electronic Line Leak Detector
Piping Release Detection Comments: Not reported
Spill Prevention Manholes: SB - Spill Containment Manhole (bucket)
Spill Prevention Manhole Comments: Not reported
OverFill Prevention: FILL - Fill Pipe (drop tube flapper)
OverFill Prevention Comment: Not reported
Comments: Not reported

Name: UNITED DAIRY FARMERS #003
Address: 7043 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236

Tank Number: T00003

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

UST

EDR ID: U000686858 **DIST/DIR:** 0.229 ESE **ELEVATION:** 833 **MAP ID:** B6

NAME: UNITED DAIRY FARMERS #003
ADDRESS: 7043 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31000567
ID/Status: REM - Removed
ID/Status: CIU - Currently In Use

Status: REM - Removed
UST Capacity: 10000
Tank Content: Gasoline
Installation Date: 04/01/1986
Construction: FRP-Fiberglass Reinforced Plastic
Date Last Used: Not reported
Date TCL Closed: Not reported
Date Removed: 09/10/2014
CAS Number: 8006-61-9
Abandoned Approved: Not reported
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: SW - Single Wall
Construction Comments: Not reported
Corrosion Protections: NR - None Required by Rule
Corrosion Protection Comments: Not reported
Primary Release Detection: ATG - Automatic Tank Gauging
Secondary Release Detection: ATG - Automatic Tank Gauging
Release Detection Comments: Not reported
Piping Configuration: SW - Single Wall
Piping Configuration Comments: Not reported
Piping Styles: P - Pressure
Piping Constructions: FRP - Fiberglass Reinforced Plastic
Piping Construction Comments: Not reported
Piping Corrosion Protections: NR - None required by rule
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: ELLD - Electronic Line Leak Detector
Piping Release Detection Comments: Not reported
Spill Prevention Manholes: SB - Spill Containment Manhole (bucket)
Spill Prevention Manhole Comments: Not reported
OverFill Prevention: FILL - Fill Pipe (drop tube flapper)
OverFill Prevention Comment: Not reported
Comments: Not reported

Name: UNITED DAIRY FARMERS #003
Address: 7043 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236

Tank Number: T00004
Status: CIU - Currently In Use
UST Capacity: 20000
Tank Content: Gasoline
Installation Date: 08/04/2015
Construction: FRP-Fiberglass Reinforced Plastic

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

UST

EDR ID: U000686858 **DIST/DIR:** 0.229 ESE **ELEVATION:** 833 **MAP ID:** B6

NAME: UNITED DAIRY FARMERS #003
ADDRESS: 7043 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31000567
ID/Status: REM - Removed
ID/Status: CIU - Currently In Use

Date Last Used: Not reported
Date TCL Closed: Not reported
Date Removed: Not reported
CAS Number: Not reported
Abandoned Approved: Not reported
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: SC- Secondarily Contained
Construction Comments: Not reported
Corrosion Protections: NR - None Required by Rule
Corrosion Protection Comments: Not reported
Primary Release Detection: IMT - Int. Monitoring (D/W Tank)
Secondary Release Detection: ATG - Automatic Tank Gauging
Release Detection Comments: Not reported
Piping Configuration: SC - Secondarily Contained
Piping Configuration Comments: Not reported
Piping Styles: P - Pressure
Piping Constructions: FPTP - Flexible Plastic Technology Piping
Piping Construction Comments: Not reported
Piping Corrosion Protections: NR - None required by rule
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: IMT - Interstitial Monitoring
Piping Release Detection Comments: ELLD
Spill Prevention Manholes: SB - Spill Containment Manhole (bucket)
Spill Prevention Manhole Comments: Not reported
OverFill Prevention: FILL - Fill Pipe (drop tube flapper)
OverFill Prevention Comment: ALARM
Comments: Not reported

Name: UNITED DAIRY FARMERS #003
Address: 7043 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236

Tank Number: T00005
Status: CIU - Currently In Use
UST Capacity: 8000
Tank Content: Diesel
Installation Date: 08/04/2015
Construction: FRP-Fiberglass Reinforced Plastic
Date Last Used: Not reported
Date TCL Closed: Not reported
Date Removed: Not reported
CAS Number: Not reported
Abandoned Approved: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

UST

EDR ID: U000686858 **DIST/DIR:** 0.229 ESE **ELEVATION:** 833 **MAP ID:** B6

NAME: UNITED DAIRY FARMERS #003
ADDRESS: 7043 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31000567
ID/Status: REM - Removed
ID/Status: CIU - Currently In Use

Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: SC- Secondarily Contained
Construction Comments: Not reported
Corrosion Protections: NR - None Required by Rule
Corrosion Protection Comments: Not reported
Primary Release Detection: IMT - Int. Monitoring (D/W Tank)
Secondary Release Detection: ATG - Automatic Tank Gauging
Release Detection Comments: Not reported
Piping Configuration: SC - Secondarily Contained
Piping Configuration Comments: Not reported
Piping Styles: P - Pressure
Piping Constructions: FPTP - Flexible Plastic Technology Piping
Piping Construction Comments: Not reported
Piping Corrosion Protections: NR - None required by rule
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: IMT - Interstitial Monitoring
Piping Release Detection Comments: ELLD
Spill Prevention Manholes: SB - Spill Containment Manhole (bucket)
Spill Prevention Manhole Comments: Not reported
OverFill Prevention: FILL - Fill Pipe (drop tube flapper)
OverFill Prevention Comment: ALARM
Comments: Not reported

Name: UNITED DAIRY FARMERS #003
Address: 7043 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236

Tank Number: T00006
Status: CIU - Currently In Use
UST Capacity: 8000
Tank Content: Gasoline
Installation Date: 08/04/2015
Construction: FRP-Fiberglass Reinforced Plastic
Date Last Used: Not reported
Date TCL Closed: Not reported
Date Removed: Not reported
CAS Number: Not reported
Abandoned Approved: Not reported
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: SC- Secondarily Contained
Construction Comments: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

UST

EDR ID: U000686858 **DIST/DIR:** 0.229 ESE **ELEVATION:** 833 **MAP ID:** B6

NAME: UNITED DAIRY FARMERS #003
ADDRESS: 7043 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31000567
ID/Status: REM - Removed
ID/Status: CIU - Currently In Use

Corrosion Protections: NR - None Required by Rule
Corrosion Protection Comments: Not reported
Primary Release Detection: IMT - Int. Monitoring (D/W Tank)
Secondary Release Detection: ATG - Automatic Tank Gauging
Release Detection Comments: Not reported
Piping Configuration: SC - Secondarily Contained
Piping Configuration Comments: Not reported
Piping Styles: P - Pressure
Piping Constructions: FPTP - Flexible Plastic Technology Piping
Piping Construction Comments: Not reported
Piping Corrosion Protections: NR - None required by rule
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: IMT - Interstitial Monitoring
Piping Release Detection Comments: ELLD
Spill Prevention Manholes: SB - Spill Containment Manhole (bucket)
Spill Prevention Manhole Comments: Not reported
OverFill Prevention: FILL - Fill Pipe (drop tube flapper)
OverFill Prevention Comment: ALARM
Comments: Not reported

LUST

EDR ID: U000686858 **DIST/DIR:** 0.229 ESE **ELEVATION:** 833 **MAP ID:** B6

NAME: UNITED DAIRY FARMERS #003
ADDRESS: 7043 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: NFA: No Further Action
ID/Status: CSN: Closure Sampling Not Required

LUST:
Name: UNITED DAIRY FARMERS #003
Address: 7043 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236
Release Number: 31000567 - N00001
Release Date: 09/09/2014
LTF Status: 1 SUS/CON from regulated UST
FR Status: NFA: No Further Action
Priority: 2
Review Date: 10/05/2015
Priority Decode: SUS/CON from non-regulated UST
Class1 Decode: A viable RP have been identified
Latitude: 39.192501
Longitude: -84.404233
Class: Viable Responsible Party has been identified
Incident Number: Not reported
Last Update: Ralph Mertz
Last Update Date: 10/08/2015
Last Update Updated: 10/05/2015
Sub Status: Approved
Rules: 2012
Coordinator: Ralph Mertz
Rating: Not reported

Name: UNITED DAIRY FARMERS #003
Address: 7043 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236
Release Number: 31000567 - N00002
Release Date: 12/04/2020
LTF Status: 6 Closure of regulated UST
FR Status: CSN: Closure Sampling Not Required
Priority: 2
Review Date: 01/28/2021
Priority Decode: SUS/CON from non-regulated UST
Class1 Decode: A viable RP have been identified
Latitude: 39.192501
Longitude: -84.404233
Class: Viable Responsible Party has been identified
Incident Number: Not reported
Last Update: Scott Sigler
Last Update Date: 01/28/2021
Last Update Updated: 01/28/2021
Sub Status: Approved
Rules: 2017

- Continued on next page -

LUST

EDR ID: U000686858 **DIST/DIR:** 0.229 ESE **ELEVATION:** 833 **MAP ID:** B6

NAME: UNITED DAIRY FARMERS #003
ADDRESS: 7043 MONTGOMERY RD
CINCINNATI, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: NFA: No Further Action
ID/Status: CSN: Closure Sampling Not Required

Coordinator: Ralph Mertz
Rating: Not reported

Name: UNITED DAIRY FARMERS #003
Address: 7043 MONTGOMERY RD
City,State,Zip: CINCINNATI, OH 45236
Release Number: 31000567 - N00003
Release Date: 12/09/2022
LTF Status: 6 Closure of regulated UST
FR Status: CSN: Closure Sampling Not Required
Priority: Not reported
Review Date: 03/15/2024
Priority Decode: Not reported
Class1 Decode: A viable RP have been identified
Latitude: 39.192501
Longitude: -84.404233
Class: Viable Responsible Party has been identified
Incident Number: Not reported
Last Update: Ralph Mertz
Last Update Date: 03/15/2024
Last Update Updated: 03/15/2024
Sub Status: Approved
Rules: 2022
Coordinator: Ryan Siath
Rating: Not reported

UST

EDR ID: U004206405 **DIST/DIR:** 0.240 SE **ELEVATION:** 820 **MAP ID:** 7

NAME: SILVERTON PUBLIC WORKS
ADDRESS: 3869 ALTA AVE
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31000738
ID/Status: REM - Removed

UST:
Name: SILVERTON PUBLIC WORKS
Address: 3869 ALTA AVE
City,State,Zip: SILVERTON, OH 45236
Facility Id: 31000738
Owner Name: Not reported
Owner Address: Not reported
Owner City/State/Zip: Not reported

Tank Number: T00001
Status: REM - Removed
UST Capacity: 550
Tank Content: Gasoline
Installation Date: Not reported
Construction: BM - Bare Metal
Date Last Used: 11/18/1996
Date TCL Closed: Not reported
Date Removed: 11/18/1996
CAS Number: 8006-61-9
Abandoned Approved: Not reported
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: Not reported
Construction Comments: Steel
Corrosion Protections: Not reported
Corrosion Protection Comments: Not reported
Primary Release Detection: AMO - Alternative Method (Other, explain)
Secondary Release Detection: Not reported
Release Detection Comments: RDTank: / RDLine:
Piping Configuration: Not reported
Piping Configuration Comments: Not reported
Piping Styles: NA - Not Applicable
Piping Constructions: OTH - Other (explain)
Piping Construction Comments: Unknown
Piping Corrosion Protections: OTH - Other (explain)
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: OTH - Other(explain)
Piping Release Detection Comments: Not reported
Spill Prevention Manholes: NP - None Present
Spill Prevention Manhole Comments: No
OverFill Prevention: Not reported
OverFill Prevention Comment: OverFill Spill: No
Comments: Not reported

- Continued on next page -

UST

EDR ID: U004206405 **DIST/DIR:** 0.240 SE **ELEVATION:** 820 **MAP ID:** 7

NAME: SILVERTON PUBLIC WORKS
ADDRESS: 3869 ALTA AVE
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31000738
ID/Status: REM - Removed

Name: SILVERTON PUBLIC WORKS
Address: 3869 ALTA AVE
City,State,Zip: SILVERTON, OH 45236

Tank Number: T00002
Status: REM - Removed
UST Capacity: 550
Tank Content: Gasoline
Installation Date: Not reported
Construction: BM - Bare Metal
Date Last Used: 01/01/1989
Date TCL Closed: Not reported
Date Removed: 01/01/1989
CAS Number: 8006-61-9
Abandoned Approved: Not reported
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: Not reported
Construction Comments: Steel
Corrosion Protections: Not reported
Corrosion Protection Comments: Not reported
Primary Release Detection: AMO - Alternative Method (Other, explain)
Secondary Release Detection: Not reported
Release Detection Comments: RDTank: / RDLine:
Piping Configuration: Not reported
Piping Configuration Comments: Not reported
Piping Styles: NA - Not Applicable
Piping Constructions: OTH - Other (explain)
Piping Construction Comments: Unknown
Piping Corrosion Protections: OTH - Other (explain)
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: OTH - Other(explain)
Piping Release Detection Comments: Not reported
Spill Prevention Manholes: NP - None Present
Spill Prevention Manhole Comments: No
OverFill Prevention: Not reported
OverFill Prevention Comment: OverFill Spill: No
Comments: Not reported

Name: SILVERTON PUBLIC WORKS
Address: 3869 ALTA AVE
City,State,Zip: SILVERTON, OH 45236

Tank Number: T00003

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

UST

EDR ID: U004206405 **DIST/DIR:** 0.240 SE **ELEVATION:** 820 **MAP ID:** 7

NAME: SILVERTON PUBLIC WORKS
ADDRESS: 3869 ALTA AVE
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: 31000738
ID/Status: REM - Removed

Status: REM - Removed
UST Capacity: 550
Tank Content: Diesel
Installation Date: Not reported
Construction: BM - Bare Metal
Date Last Used: 11/18/1996
Date TCL Closed: Not reported
Date Removed: 11/18/1996
CAS Number: 68334-30-5
Abandoned Approved: Not reported
Regulated: YES
Sensitive Area: NO
Date Of Sensitivity: Not reported
UST Configurations: Not reported
Construction Comments: Steel
Corrosion Protections: Not reported
Corrosion Protection Comments: Not reported
Primary Release Detection: AMO - Alternative Method (Other, explain)
Secondary Release Detection: Not reported
Release Detection Comments: RDTank: / RDLine:
Piping Configuration: Not reported
Piping Configuration Comments: Not reported
Piping Styles: NA - Not Applicable
Piping Constructions: OTH - Other (explain)
Piping Construction Comments: Unknown
Piping Corrosion Protections: OTH - Other (explain)
Piping Corrosion Protection Comments: Not reported
Piping Release Detections: OTH - Other(explain)
Piping Release Detection Comments: Not reported
Spill Prevention Manholes: NP - None Present
Spill Prevention Manhole Comments: No
OverFill Prevention: Not reported
OverFill Prevention Comment: OverFill Spill: No
Comments: Not reported

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

LUST

EDR ID: U004206405 **DIST/DIR:** 0.240 SE **ELEVATION:** 820 **MAP ID:** 7

NAME: SILVERTON PUBLIC WORKS
ADDRESS: 3869 ALTA AVE
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: NFA: No Further Action

LUST:
Name: SILVERTON PUBLIC WORKS
Address: 3869 ALTA AVE
City,State,Zip: SILVERTON, OH 45236
Release Number: 31000738 - N00001
Release Date: 11/18/1996
LTF Status: 6 Closure of regulated UST
FR Status: NFA: No Further Action
Priority: Not reported
Review Date: 11/25/1997
Priority Decode: Not reported
Class1 Decode: A viable RP have been identified
Latitude: 39.189865
Longitude: -84.405024
Class: Viable Responsible Party has been identified
Incident Number: 316139700.0
Last Update: Ryan Siath
Last Update Date: 12/06/2023
Last Update Updated: Not reported
Sub Status: Not reported
Rules: 1992
Coordinator: Not reported
Rating: Not reported

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1001489445 **DIST/DIR:** 0.249 ESE **ELEVATION:** 827 **MAP ID:** B8

NAME: METRO/SORTA BOND HILL DIV
ADDRESS: 7000 HIGHLAND AVENUE
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHR000037259

RCRA Listings:
Date Form Received by Agency: 20200707
Handler Name: Metro/Sorta
Handler Address: 7000 Highland Avenue
Handler City,State,Zip: CINCINNATI, OH 45236
EPA ID: OHR000037259
Contact Name: Not reported
Contact Address: Not reported
Contact City,State,Zip: Not reported
Contact Telephone: Not reported
Contact Fax: Not reported
Contact Email: Not reported
Contact Title: Not reported
EPA Region: 05
Land Type: County
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: Not reported
State District Owner: Oh
State District: SW
Mailing Address: Not reported
Mailing City,State,Zip: Not reported
Owner Name: Not reported
Owner Type: Not reported
Operator Name: Not reported
Operator Type: Not reported
Short-Term Generator Activity: No
Importer Activity: No
Mixed Waste Generator: No
Transporter Activity: No
Transfer Facility Activity: No
Recycler Activity with Storage: No
Small Quantity On-Site Burner Exemption: No
Smelting Melting and Refining Furnace Exemption: No
Underground Injection Control: No
Off-Site Waste Receipt: No
Universal Waste Indicator: No
Universal Waste Destination Facility: No
Federal Universal Waste: No
Active Site State-Reg Handler: ---
Federal Facility Indicator: Not reported
Hazardous Secondary Material Indicator: N

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1001489445 **DIST/DIR:** 0.249 ESE **ELEVATION:** 827 **MAP ID:** B8

NAME: METRO/SORTA BOND HILL DIV
ADDRESS: 7000 HIGHLAND AVENUE
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHR000037259

Sub-Part K Indicator: Not reported
2018 GPRA Permit Baseline: Not on the Baseline
2018 GPRA Renewals Baseline: Not on the Baseline
202 GPRA Corrective Action Baseline: No
Subject to Corrective Action Universe: No
Non-TSDFs Where RCRA CA has Been Imposed Universe: No
Corrective Action Priority Ranking: No NCAPS ranking
Environmental Control Indicator: No
Institutional Control Indicator: No
Human Exposure Controls Indicator: N/A
Groundwater Controls Indicator: N/A
Significant Non-Complier Universe: No
Unaddressed Significant Non-Complier Universe: No
Addressed Significant Non-Complier Universe: No
Significant Non-Complier With a Compliance Schedule Universe: No
Financial Assurance Required: Not reported
Handler Date of Last Change: 20200707
Recognized Trader-Importer: No
Recognized Trader-Exporter: No
Importer of Spent Lead Acid Batteries: No
Exporter of Spent Lead Acid Batteries: No
Recycler Activity Without Storage: No
Manifest Broker: No
Sub-Part P Indicator: No

Hazardous Waste Summary:
Waste Code: D001
Waste Description: Ignitable Waste

Waste Code: D008
Waste Description: Lead

Waste Code: D018
Waste Description: Benzene

Handler - Owner Operator:
Owner/Operator Indicator: Owner
Owner/Operator Name: METRO/SORTA INC
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 7000 HIGHLAND AVENUE
Owner/Operator City,State,Zip: CINCINNATI, OH 45236

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Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

RCRA NonGen / NLR

EDR ID: 1001489445 **DIST/DIR:** 0.249 ESE **ELEVATION:** 827 **MAP ID:** B8

NAME: METRO/SORTA BOND HILL DIV
ADDRESS: 7000 HIGHLAND AVENUE
CINCINNATI, OH 45236
HAMILTON
SOURCE: US Environmental Protection Agency

Rev: 06/02/2025
ID/Status: OHR000037259

Owner/Operator Telephone: 513-632-7542
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20200707
Handler Name: METRO/SORTA
Federal Waste Generator Description: Not a generator, verified
State District Owner: Oh
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

Receive Date: 19990715
Handler Name: METRO/SORTA
Federal Waste Generator Description: Small Quantity Generator
State District Owner: Oh
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: No
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Codes: No NAICS Codes Found

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

LUST

EDR ID: U004085620 **DIST/DIR:** 0.309 East **ELEVATION:** 839 **MAP ID:** 9

NAME: BP #09321
ADDRESS: 7123-7125 MONTGOMERY RD
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: NFA: No Further Action

LUST:
Name: BP #09321
Address: 7123-7125 MONTGOMERY RD
City,State,Zip: SILVERTON, OH 45236
Release Number: 31010280 - N00001
Release Date: 10/10/1996
LTF Status: 1 SUS/CON from regulated UST
FR Status: NFA: No Further Action
Priority: 2
Review Date: 10/29/2002
Priority Decode: SUS/CON from non-regulated UST
Class1 Decode: A viable RP have been identified
Latitude: 39.192698
Longitude: -84.403115
Class: Viable Responsible Party has been identified
Incident Number: 316130100.0
Last Update: Not reported
Last Update Date: 04/28/2012
Last Update Updated: 10/30/2002
Sub Status: Not reported
Rules: 1992
Coordinator: Jason Anthony
Rating: 6

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

US BROWNFIELDS

EDR ID: 1027586449 **DIST/DIR:** 0.399 East **ELEVATION:** 850 **MAP ID:** C10

NAME: FRITZ AUTO BODY
ADDRESS: 7210 MONTGOMERY RD
SILVERTON, OH 45326
MIAMI
SOURCE: US Environmental Protection Agency

Rev: 09/09/2024

US BROWNFIELDS:
Name: Fritz Auto Body
Address: 7210 Montgomery Rd
City,State,Zip: SILVERTON, OH 45326
Property ID: 252656
Property Alias: Not reported
Recipient Name: Ohio Environmental Protection Agency
Grant Type: Not reported
Property Number: 602-002-0236-00 & 602-002-0256-00 & 602-002-0254-00
Parcel Size: 0.87
Latitude: 40.142805
Longitude: -84.11009
Census Tract: 39109390100
State or Tribal Voluntary Response Program: Y
Program Name: RP
AA Activity Funded: Not reported
Start Date: Not reported
Redev Completition Date: Not reported
Completed Date: Not reported
Cleanup Funding: Not reported
Cleanup Funding Source: Not reported
Activity Funded: Phase II +Geophysical Survey
Assessment Funding: Not reported
Assessment Funding Source: Not reported
Redevelopment Funding: Not reported
Contaminants REC: Lead Other Metals VOCs
Contaminants Found at Actionable Level: Lead Other Metals VOCs
Redev. Funding Source: Not reported
Redev. Funding Entity Name: Not reported
Contaminants Found Below Actionable Level: Not reported
Redevelopment Start Date: Not reported
Assessment Funding Entity: Not reported
Cleanup Funding Entity: Not reported
Climate Adapt Mitig - Planning or Assessment: Not reported
Cooperative Agreement Number: 05E01546
Start Date: Not reported
Ownership Entity: Private
Additional Institutional Controls Information: Dependent on redevelopment plans
Completion Date: Not reported
Address of Data Sources (URL if available) 1: Not reported
Cleanup Required: Y
Indicates Cleanup/Treatment Tech Implemented: U
Institutional Controls Required: Y
IC Category Proprietary Controls: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

US BROWNFIELDS

EDR ID: 1027586449 **DIST/DIR:** 0.399 East **ELEVATION:** 850 **MAP ID:** C10

NAME: FRITZ AUTO BODY
ADDRESS: 7210 MONTGOMERY RD
SILVERTON, OH 45326
MIAMI
SOURCE: US Environmental Protection Agency

Rev: 09/09/2024

Excavation and Disposal of Soils: Not reported
Extraction of contaminants: Not reported
IC Cat. Info. Devices: Not reported
Removal of materials (tanks and piping, etc.): Not reported
IC Cat. Gov. Controls: Y
Reduction of Contam Bioremediation/Phytoremediation: Not reported
IC Cat. Enforcement Permit Tools: Not reported
Cleanup of structures: Not reported
IC in place date: Not reported
Additional Cleanup/Treatment Tech Info: Not reported
IC in place: Not reported
Address of Data Source (URL if available) 2: Not reported
Indicate whether Engineering Controls are required: Y
State/tribal program ID: Not reported
Cover Technologies (e.g., Capping): Not reported
Security (e.g., Guard, Fence): Not reported
Immobilization Process: Not reported
Engineering Barriers (e.g., Slurry Walls, Sheet): Not reported
Other: Y
Additional Engineering Controls Information: Not reported
Address of Data Source (URL if available) 3: Not reported
Indicate whether Engineering Controls are in place: N
Date Engineering Controls put into place: Not reported
ACRES Cleaned Up: Not reported
Section 128(a) State/Tribal: Not reported
Multipurpose - Cost Share Amount: Not reported
Cleanup - Cost Share Amount: Not reported
RLF Loan - Total Loan Amount: Not reported
RLF - Loan Signed Date: Not reported
RLF Loan - Anticipated Repayment Start Date: Not reported
RLF Loan - Anticipated Repayment End Date: Not reported
RLF Loan - Interest Rate: Not reported
RLF Loan - EPA Funds Used: Not reported
Contaminant Cleanup: Not reported
RLF Loan - Cost Share Used: Not reported
Media Affected: Air Ground Water Soil
RLF Loan - Program Income Used: Not reported
Media Cleanup: Not reported
RLF Loan - Discounted: Not reported
RLF Loan - Discount Percentage: Not reported
RLF Subgrant - Total Subgrant Amount: Not reported
RLF Subgrant - Signed Date: Not reported
RLF Subgrant - EPA Funds Used: Not reported
RLF Subgrant - Cost Share Used: Not reported
RLF Subgrant - Program Income Used: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

US BROWNFIELDS

EDR ID: 1027586449 **DIST/DIR:** 0.399 East **ELEVATION:** 850 **MAP ID:** C10

NAME: FRITZ AUTO BODY **Rev:** 09/09/2024

ADDRESS: 7210 MONTGOMERY RD
SILVERTON, OH 45326
MIAMI

SOURCE: US Environmental Protection Agency

RLF Direct Cleanup - Total Funding Amt: Not reported
Num. of cleanup and re-dev. jobs: Not reported
RLF Direct Cleanup - Source of Funding: Not reported
RLF Leveraged - Funding Source Type: Not reported
Past use greenspace acreage: Not reported
Past use residential acreage: Not reported
RLF Leveraged - Entity Providing Funding: Not reported
RLF Leveraged - Funding Amount: Not reported
Cleanup Completion Doc - NFA Letter Received: Not reported
Past use commercial acreage: Not reported
NFA Letter Date Received: Not reported
Past use industrial acreage: Not reported
Cleanup Comp Doc - Letter/Signed Rep Qualified Pro: Not reported
Future use greenspace acreage: Not reported
Letter/Signed Report Date Received: Not reported
Future use residential acreage: Not reported
Future use commercial acreage: Not reported
Cleanup Completion Doc- Other forms of Doc: Not reported
Future use industrial acreage: Not reported
Climate Adapt and Mitiga - Demo or Cleanup: Not reported
ReDev Activity Funded: Not reported
Amount of Funding Expended on this Activity 2: Not reported
Number of Redevelopment Jobs Leveraged: Not reported
Climate Adaptation and Mitigation Redevelopment: Not reported
Radius: 0.5
Below Poverty Number: 7
Below Poverty Percent: 1.6
Meidan Income: 7109
Meidan Income Number: 42
Meidan Income Percent: 9.59
Vacant Housing Number: 12
Vacant Housing Percent: 6.54
Unemployed Number: 16
Unemployed Percent: 3.65

Name: Fritz Auto Body
Address: 7210 Montgomery Rd
City,State,Zip: SILVERTON, OH 45326
Property ID: 252656
Property Alias: Not reported
Recipient Name: Ohio Environmental Protection Agency
Grant Type: Not reported
Property Number: 602-002-0236-00 & 602-002-0256-00 & 602-002-0254-00
Parcel Size: 0.87
Latitude: 40.142805

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

US BROWNFIELDS

EDR ID: 1027586449 **DIST/DIR:** 0.399 East **ELEVATION:** 850 **MAP ID:** C10

NAME: FRITZ AUTO BODY **Rev:** 09/09/2024

ADDRESS: 7210 MONTGOMERY RD
SILVERTON, OH 45326
MIAMI

SOURCE: US Environmental Protection Agency

Longitude: -84.11009
Census Tract: 39109390100
State or Tribal Voluntary Response Program: Y
Program Name: RP
AA Activity Funded: Not reported
Start Date: Not reported
Redev Completition Date: Not reported
Completed Date: Not reported
Cleanup Funding: Not reported
Cleanup Funding Source: Not reported
Activity Funded: Phase II +Geophysical Survey
Assessment Funding: Not reported
Assessment Funding Source: Not reported
Redevelopment Funding: Not reported
Contaminants REC: Lead Other Metals VOCs
Contaminants Found at Actionable Level: Lead Other Metals VOCs
Redev. Funding Source: Not reported
Redev. Funding Entity Name: Not reported
Contaminants Found Below Actionable Level: Not reported
Redevelopment Start Date: Not reported
Assessment Funding Entity: Not reported
Cleanup Funding Entity: Not reported
Climate Adapt Mitig - Planning or Assessment: Not reported
Cooperative Agreement Number: 05E01546
Start Date: Not reported
Ownership Entity: Private
Additional Institutional Controls Information: Dependent on redevelopment plans
Completion Date: Not reported
Address of Data Sources (URL if available) 1: Not reported
Cleanup Required: Y
Indicates Cleanup/Treatment Tech Implemented: U
Institutional Controls Required: Y
IC Category Proprietary Controls: Not reported
Excavation and Disposal of Soils: Not reported
Extraction of contaminants: Not reported
IC Cat. Info. Devices: Not reported
Removal of materials (tanks and piping, etc.): Not reported
IC Cat. Gov. Controls: Y
Reduction of Contam Bioremediation/Phytoremediation: Not reported
IC Cat. Enforcement Permit Tools: Not reported
Cleanup of structures: Not reported
IC in place date: Not reported
Additional Cleanup/Treatment Tech Info: Not reported
IC in place: Not reported
Address of Data Source (URL if available) 2: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

US BROWNFIELDS

EDR ID: 1027586449 **DIST/DIR:** 0.399 East **ELEVATION:** 850 **MAP ID:** C10

NAME: FRITZ AUTO BODY **Rev:** 09/09/2024

ADDRESS: 7210 MONTGOMERY RD
SILVERTON, OH 45326
MIAMI

SOURCE: US Environmental Protection Agency

Indicate whether Engineering Controls are required: Y
State/tribal program ID: Not reported
Cover Technologies (e.g., Capping): Not reported
Security (e.g., Guard, Fence): Not reported
Immobilization Process: Not reported
Engineering Barriers (e.g., Slurry Walls, Sheet): Not reported
Other: Y
Additional Engineering Controls Information: Not reported
Address of Data Source (URL if available) 3: Not reported
Indicate whether Engineering Controls are in place: N
Date Engineering Controls put into place: Not reported
ACRES Cleaned Up: Not reported
Section 128(a) State/Tribal: Not reported
Multipurpose - Cost Share Amount: Not reported
Cleanup - Cost Share Amount: Not reported
RLF Loan - Total Loan Amount: Not reported
RLF - Loan Signed Date: Not reported
RLF Loan - Anticipated Repayment Start Date: Not reported
RLF Loan - Anticipated Repayment End Date: Not reported
RLF Loan - Interest Rate: Not reported
RLF Loan - EPA Funds Used: Not reported
Contaminant Cleanup: Not reported
RLF Loan - Cost Share Used: Not reported
Media Affected: Air Ground Water Soil
RLF Loan - Program Income Used: Not reported
Media Cleanup: Not reported
RLF Loan - Discounted: Not reported
RLF Loan - Discount Percentage: Not reported
RLF Subgrant - Total Subgrant Amount: Not reported
RLF Subgrant - Signed Date: Not reported
RLF Subgrant - EPA Funds Used: Not reported
RLF Subgrant - Cost Share Used: Not reported
RLF Subgrant - Program Income Used: Not reported
RLF Direct Cleanup - Total Funding Amt: Not reported
Num. of cleanup and re-dev. jobs: Not reported
RLF Direct Cleanup - Source of Funding: Not reported
RLF Leveraged - Funding Source Type: Not reported
Past use greenspace acreage: Not reported
Past use residential acreage: Not reported
RLF Leveraged - Entity Providing Funding: Not reported
RLF Leveraged - Funding Amount: Not reported
Cleanup Completion Doc - NFA Letter Received: N
Past use commercial acreage: Not reported
NFA Letter Date Received: Not reported
Past use industrial acreage: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

US BROWNFIELDS

EDR ID: 1027586449 **DIST/DIR:** 0.399 East **ELEVATION:** 850 **MAP ID:** C10

NAME: FRITZ AUTO BODY **Rev:** 09/09/2024

ADDRESS: 7210 MONTGOMERY RD
SILVERTON, OH 45326
MIAMI

SOURCE: US Environmental Protection Agency

Cleanup Comp Doc - Letter/Signed Rep Qualified Pro: N
Future use greenspace acreage: Not reported
Letter/Signed Report Date Received: Not reported
Future use residential acreage: Not reported
Future use commercial acreage: Not reported
Cleanup Completion Doc- Other forms of Doc: Not reported
Future use industrial acreage: Not reported
Climate Adapt and Mitiga - Demo or Cleanup: Not reported
ReDev Activity Funded: Not reported
Amount of Funding Expended on this Activity 2: Not reported
Number of Redevelopment Jobs Leveraged: Not reported
Climate Adaptation and Mitigation Redevelopment: Not reported
Radius: 0.5
Below Poverty Number: 7
Below Poverty Percent: 1.6
Meidan Income: 7109
Meidan Income Number: 42
Meidan Income Percent: 9.59
Vacant Housing Number: 12
Vacant Housing Percent: 6.54
Unemployed Number: 16
Unemployed Percent: 3.65

Name: Fritz Auto Body
Address: 7210 Montgomery Rd
City,State,Zip: SILVERTON, OH 45326
Property ID: 252656
Property Alias: Not reported
Recipient Name: Ohio Environmental Protection Agency
Grant Type: Not reported
Property Number: 602-002-0236-00 & 602-002-0256-00 & 602-002-0254-00
Parcel Size: 0.87
Latitude: 40.142805
Longitude: -84.11009
Census Tract: 39109390100
State or Tribal Voluntary Response Program: Y
Program Name: RP
AA Activity Funded: Phase II +Geophysical Survey
Start Date: Not reported
Redev Completition Date: Not reported
Completed Date: Not reported
Cleanup Funding: Not reported
Cleanup Funding Source: Not reported
Activity Funded: Phase II +Geophysical Survey
Assessment Funding: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

US BROWNFIELDS

EDR ID: 1027586449 **DIST/DIR:** 0.399 East **ELEVATION:** 850 **MAP ID:** C10

NAME: FRITZ AUTO BODY **Rev:** 09/09/2024

ADDRESS: 7210 MONTGOMERY RD
SILVERTON, OH 45326
MIAMI

SOURCE: US Environmental Protection Agency

Assessment Funding Source: Not reported
Redevelopment Funding: Not reported
Contaminants REC: Lead Other Metals VOCs
Contaminants Found at Actionable Level: Lead Other Metals VOCs
Redev. Funding Source: Not reported
Redev. Funding Entity Name: Not reported
Contaminants Found Below Actionable Level: Not reported
Redevelopment Start Date: Not reported
Assessment Funding Entity: EPA
Cleanup Funding Entity: Not reported
Climate Adapt Mitig - Planning or Assessment: Not reported
Cooperative Agreement Number: 05E01546
Start Date: 2020-02-03 00:00:00
Ownership Entity: Private
Additional Institutional Controls Information: Dependent on redevelopment plans
Completion Date: 2020-08-17 00:00:00
Address of Data Sources (URL if available) 1: Not reported
Cleanup Required: Y
Indicates Cleanup/Treatment Tech Implemented: U
Institutional Controls Required: Y
IC Category Proprietary Controls: Not reported
Excavation and Disposal of Soils: Not reported
Extraction of contaminants: Not reported
IC Cat. Info. Devices: Not reported
Removal of materials (tanks and piping, etc.): Not reported
IC Cat. Gov. Controls: Y
Reduction of Contam Bioremediation/Phytoremediation: Not reported
IC Cat. Enforcement Permit Tools: Not reported
Cleanup of structures: Not reported
IC in place date: Not reported
Additional Cleanup/Treatment Tech Info: Not reported
IC in place: Not reported
Address of Data Source (URL if available) 2: Not reported
Indicate whether Engineering Controls are required: Y
State/tribal program ID: Not reported
Cover Technologies (e.g., Capping): Not reported
Security (e.g., Guard, Fence): Not reported
Immobilization Process: Not reported
Engineering Barriers (e.g., Slurry Walls, Sheet): Not reported
Other: Y
Additional Engineering Controls Information: Not reported
Address of Data Source (URL if available) 3: Not reported
Indicate whether Engineering Controls are in place: N
Date Engineering Controls put into place: Not reported
ACRES Cleaned Up: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

US BROWNFIELDS

EDR ID: 1027586449 **DIST/DIR:** 0.399 East **ELEVATION:** 850 **MAP ID:** C10

NAME: FRITZ AUTO BODY **Rev:** 09/09/2024

ADDRESS: 7210 MONTGOMERY RD
SILVERTON, OH 45326
MIAMI

SOURCE: US Environmental Protection Agency

Section 128(a) State/Tribal: Not reported
Multipurpose - Cost Share Amount: Not reported
Cleanup - Cost Share Amount: Not reported
RLF Loan - Total Loan Amount: Not reported
RLF - Loan Signed Date: Not reported
RLF Loan - Anticipated Repayment Start Date: Not reported
RLF Loan - Anticipated Repayment End Date: Not reported
RLF Loan - Interest Rate: Not reported
RLF Loan - EPA Funds Used: Not reported
Contaminant Cleanup: Not reported
RLF Loan - Cost Share Used: Not reported
Media Affected: Air Ground Water Soil
RLF Loan - Program Income Used: Not reported
Media Cleanup: Not reported
RLF Loan - Discounted: Not reported
RLF Loan - Discount Percentage: Not reported
RLF Subgrant - Total Subgrant Amount: Not reported
RLF Subgrant - Signed Date: Not reported
RLF Subgrant - EPA Funds Used: Not reported
RLF Subgrant - Cost Share Used: Not reported
RLF Subgrant - Program Income Used: Not reported
RLF Direct Cleanup - Total Funding Amt: Not reported
Num. of cleanup and re-dev. jobs: Not reported
RLF Direct Cleanup - Source of Funding: Not reported
RLF Leveraged - Funding Source Type: Not reported
Past use greenspace acreage: Not reported
Past use residential acreage: Not reported
RLF Leveraged - Entity Providing Funding: Not reported
RLF Leveraged - Funding Amount: Not reported
Cleanup Completion Doc - NFA Letter Received: Not reported
Past use commercial acreage: Not reported
NFA Letter Date Received: Not reported
Past use industrial acreage: Not reported
Cleanup Comp Doc - Letter/Signed Rep Qualified Pro: Not reported
Future use greenspace acreage: Not reported
Letter/Signed Report Date Received: Not reported
Future use residential acreage: Not reported
Future use commercial acreage: Not reported
Cleanup Completion Doc- Other forms of Doc: Not reported
Future use industrial acreage: Not reported
Climate Adapt and Mitiga - Demo or Cleanup: Not reported
ReDev Activity Funded: Not reported
Amount of Funding Expended on this Activity 2: Not reported
Number of Redevelopment Jobs Leveraged: Not reported
Climate Adaptation and Mitigation Redevelopment: Not reported

- Continued on next page -

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

US BROWNFIELDS

EDR ID: 1027586449 **DIST/DIR:** 0.399 East **ELEVATION:** 850 **MAP ID:** C10

NAME: FRITZ AUTO BODY **Rev:** 09/09/2024

ADDRESS: 7210 MONTGOMERY RD
SILVERTON, OH 45326
MIAMI

SOURCE: US Environmental Protection Agency

Radius: 0.5
Below Poverty Number: 7
Below Poverty Percent: 1.6
Meidan Income: 7109
Meidan Income Number: 42
Meidan Income Percent: 9.59
Vacant Housing Number: 12
Vacant Housing Percent: 6.54
Unemployed Number: 16
Unemployed Percent: 3.65

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

BROWNFIELDS

EDR ID: S126205060 **DIST/DIR:** 0.399 East **ELEVATION:** 850 **MAP ID:** C11

NAME: FRITZ AUTO BODY, SILVERTON **Rev:** 06/02/2025
ID/Status: 3433

ADDRESS: 7210 MONTGOMERY RD
SILVERTON, OH 45236
HAMILTON

SOURCE: OH Ohio EPA

BROWNFIELDS:
Name: FORMER FRITZ'S AUTO BODY
Address: 7210 MONTGOMERY ROAD
City,State,Zip: SILVERTON, OH 45236
App Id: 3433
District: SEDO
Community Name: Not reported
Community Website: Not reported
Contact Name: Tom Carroll
Contact Title: Village Manager
Contact Address: 6943 Montgomery Road
Contact County: Hamilton
Contact City/State/Zip: Silverton, OH
Contact Phone: 513-792-6560
Contact Email: t.carroll@silvertonoh.us
Current Land Use: Not reported
Current Land Use (Other): Not reported
Past Land Use: Not reported
Past Land Use (Other): Not reported
Current Zoning: C-1 Neighborhood Commercial District
Vacancy: Partially Occupied
Site Size (Acres): 0.868
Usable Buildings: 2
Building Space (Sq. Ft.): 7,700
Utilities Available: Not reported
Parcel Numbers: 602-0002-0236-00, 602-0002-0256-00, and 602-0002-0254-00
Environmental Assessment: Not reported
General Comments: Not reported
Property History: Not reported
Proximity: CVG Airport - 23.1 miles; Silverton - 11.2 miles from the Ohio River in downtown Cincinnati
COF Project: Not reported
Date Entered: 05/30/2023
Owner Permission Rec: Not reported
Associated Sites: Not reported

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

DERR

EDR ID: S126205060 **DIST/DIR:** 0.399 East **ELEVATION:** 850 **MAP ID:** C11

NAME: FRITZ AUTO BODY, SILVERTON
ADDRESS: 7210 MONTGOMERY RD
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Ohio EPA

Rev: 03/21/2025
ID/Status: 531003474
ID/Status: SA

DERR:
Name: FRITZ AUTO BODY, SILVERTON
Address: 7210 MONTGOMERY RD
City,State,Zip: SILVERTON, OH 45236-
DERR ID: 531003474
District: SWDO
Alias: Not reported
Lat/Long: 39.19283889 -84.40055556
CERCLIS ID: Not reported
Program: Site Assessment
Decode for Activity: Site Assessment

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

LUST

EDR ID: U004291073 **DIST/DIR:** 0.407 SW **ELEVATION:** 839 **MAP ID:** 12

NAME: ORPHAN TANKS
ADDRESS: 6549 MONTGOMERY ROAD
CINCINNATI, OH 45213
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: NFA: No Further Action

LUST:
Name: ORPHAN TANKS
Address: 6549 MONTGOMERY ROAD
City,State,Zip: CINCINNATI, OH 45213
Release Number: 31011116 - N00001
Release Date: 08/27/2018
LTF Status: 6 Closure of regulated UST
FR Status: NFA: No Further Action
Priority: 2
Review Date: 11/30/2018
Priority Decode: SUS/CON from non-regulated UST
Class1 Decode: A viable RP have been identified
Latitude: 39.188537
Longitude: -84.414748
Class: Viable Responsible Party has been identified
Incident Number: Not reported
Last Update: Ralph Mertz
Last Update Date: 11/30/2018
Last Update Updated: 11/30/2018
Sub Status: Approved
Rules: 2017
Coordinator: Ralph Mertz
Rating: Not reported

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

LUST

EDR ID: U004218313 **DIST/DIR:** 0.441 ENE **ELEVATION:** 854 **MAP ID:** 13

NAME: FORMER GULF OIL
ADDRESS: 7001 PLAINFIELD PIKE
CINCINNATI, OH 45242
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: NFA: No Further Action

LUST:
Name: FORMER GULF OIL
Address: 7001 PLAINFIELD PIKE
City,State,Zip: CINCINNATI, OH 45242
Release Number: 31010316 - N00001
Release Date: 07/09/1998
LTF Status: 1 SUS/CON from regulated UST
FR Status: NFA: No Further Action
Priority: 2
Review Date: 04/17/2006
Priority Decode: SUS/CON from non-regulated UST
Class1 Decode: A viable RP have been identified
Latitude: 39.196042
Longitude: -84.400476
Class: Viable Responsible Party has been identified
Incident Number: 318111300.0
Last Update: Not reported
Last Update Date: 04/28/2012
Last Update Updated: 04/18/2006
Sub Status: Not reported
Rules: 2005
Coordinator: Ralph Mertz
Rating: 14

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

LUST

EDR ID: U004090337 **DIST/DIR:** 0.446 East **ELEVATION:** 850 **MAP ID:** C14

NAME: FIRE DEPT
ADDRESS: 6860 PLAINFIELD RD
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: RPT: a possible incident is reported

LUST:
Name: FIRE DEPT
Address: 6860 PLAINFIELD RD
City,State,Zip: SILVERTON, OH 45236
Release Number: 31002151 - N00001
Release Date: 11/17/1997
LTF Status: 5 Petro incident, not from spill/overfill/release
FR Status: RPT: a possible incident is reported
Priority: 2
Review Date: 03/14/2018
Priority Decode: SUS/CON from non-regulated UST
Class1 Decode: A viable RP have been identified
Latitude: 39.192496
Longitude: -84.400479
Class: Viable Responsible Party has been identified
Incident Number: Not reported
Last Update: Scott Sigler
Last Update Date: 03/14/2018
Last Update Updated: 03/14/2018
Sub Status: Approved
Rules: 1992
Coordinator: Ralph Mertz
Rating: 14

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

LUST

EDR ID: U004207183 **DIST/DIR:** 0.467 SW **ELEVATION:** 831 **MAP ID:** 15

NAME: FORMER TROLLEY TURN AROUND
ADDRESS: 6541 MONTGOMERY ROAD
CINCINNATI, OH 45213
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: NFA: No Further Action

LUST:
Name: FORMER TROLLEY TURN AROUND
Address: 6541 MONTGOMERY ROAD
City,State,Zip: CINCINNATI, OH 45213
Release Number: 31010498 - N00001
Release Date: 08/22/2000
LTF Status: 6 Closure of regulated UST
FR Status: NFA: No Further Action
Priority: Not reported
Review Date: 04/26/2001
Priority Decode: Not reported
Class1 Decode: A viable RP have been identified
Latitude: 39.188083
Longitude: -84.415533
Class: Viable Responsible Party has been identified
Incident Number: Not reported
Last Update: Ryan Siath
Last Update Date: 06/10/2024
Last Update Updated: 04/05/2001
Sub Status: Not reported
Rules: 1999
Coordinator: Not reported
Rating: 6

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

LUST

EDR ID: U004206766 **DIST/DIR:** 0.495 ENE **ELEVATION:** 858 **MAP ID:** 16

NAME: PROFITTS AUTO CENTER
ADDRESS: 7028 PLAINFIELD RD
SILVERTON, OH 45236
HAMILTON
SOURCE: OH Department of Commerce

Rev: 05/05/2025
ID/Status: CLO: Closure

LUST:
Name: PROFITTS AUTO CENTER
Address: 7028 PLAINFIELD RD
City,State,Zip: SILVERTON, OH 45236
Release Number: 31002305 - N00001
Release Date: 10/13/1995
LTF Status: 6 Closure of regulated UST
FR Status: CLO: Closure
Priority: 2
Review Date: 11/22/2024
Priority Decode: SUS/CON from non-regulated UST
Class1 Decode: The RP is non-viable
Latitude: 39.196854
Longitude: -84.400057
Class: Responsible Party is non-viable
Incident Number: 315131900.0
Last Update: Ryan Siath
Last Update Date: 11/22/2024
Last Update Updated: 02/01/2013
Sub Status: Required
Rules: 1992
Coordinator: Ryan Siath
Rating: 0

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

HIST LF

EDR ID: S121268007 **DIST/DIR:** 0.702 WNW **ELEVATION:** 769 **MAP ID:** D17

NAME: AMBERLY VILLAGE LF
ADDRESS:
, OH
HAMILTON
SOURCE: OH Ohio EPA

Rev: 09/23/2024

HIST LF:
Name: AMBERLY VILLAGE LF
Address: Not reported
City,State,Zip: OH
Year closed: 1982
Publicly owned: Not reported
Object ID: 3107
Location: Not reported
Latitude: 39.1970043
Longitude: -84.42216626
Site 2: Not reported
Site 3: Not reported
Site 4: Not reported
Site 5: Not reported
Site 6: Not reported
Waste Type: MSW
Capacity: Not reported
SWF ID: Not reported
Owner Name: Not reported
Owner Address: Not reported
Owner City: Not reported
Owner Zip: Not reported
Ohio ID: Not reported
District: Not reported
X Coord: -84.422166264
Y Coord: 39.197004299
Year Open: 0
Year Ceased: 0
Access: Not reported
Comments: Not reported
OEPADO: SWDO
Edit Date: 09/10/2013
GIS ID: Not reported
Sec ID: Not reported
Coreplac: Not reported

Site Detail Report

Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

HIST LF

EDR ID: S105859830 **DIST/DIR:** 0.703 WNW **ELEVATION:** 763 **MAP ID:** D18

NAME: AMBERLY VILLAGE LANDFILL
ADDRESS: SECTION 25
AMBERLY TOWNSHIP, OH
HAMILTON
SOURCE: OH Ohio EPA

Rev: 09/23/2024

HIST LF:
Name: AMBERLY VILLAGE LANDFILL
Address: SECTION 25
City,State,Zip: AMBERLY TOWNSHIP, OH
Year closed: 1982
Publicly owned: Y
Object ID: Not reported
Location: NORTH SIDE OF SECTION ROAD 1/4 MILE EAST OF RIDGE ROAD JUNCTION.
Latitude: 39 11 49
Longitude: 84 25 20
Site 2: Not reported
Site 3: Not reported
Site 4: Not reported
Site 5: Not reported
Site 6: Not reported
Waste Type: HOUSEHOLD
Capacity: 20 ACRES
SWF ID: 310006
Owner Name: VILLAGE OF AMBERLY
Owner Address: 7149 RIDGE ROAD
Owner City: CINCINNATI
Owner Zip: 45237
Ohio ID: N
District: 5
X Coord: Not reported
Y Coord: Not reported
Year Open: Not reported
Year Ceased: Not reported
Access: Not reported
Comments: Not reported
OEPADO: Not reported
Edit Date: Not reported
GIS ID: Not reported
Sec ID: Not reported
Coreplac: Not reported

Database Descriptions

NPL: NPL National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices. NPL - National Priority List Proposed NPL - Proposed National Priority List Sites. NPL LIENS - Federal Superfund Liens.

NPL Delisted: Delisted NPL The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate. Delisted NPL - National Priority List Deletions

CERCLIS: FEDERAL FACILITY A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities. FEDERAL FACILITY - Federal Facility Site Information listing SEMS - Superfund Enterprise Management System.

NFRAP: SEMS-ARCHIVE SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site. SEMS-ARCHIVE - Superfund Enterprise Management System Archive

RCRA COR ACT: CORRACTS CORRACTS identifies hazardous waste handlers with RCRA corrective action activity. CORRACTS - Corrective Action Report

RCRA TSD: RCRA-TSDF RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste. RCRA-TSDF - RCRA - Treatment, Storage and Disposal

RCRA GEN: RCRA-LQG RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. RCRA-LQG - RCRA - Large Quantity Generators RCRA-SQG - RCRA - Small Quantity Generators. RCRA-VSQG - RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators).

Federal IC / EC: LUCIS LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties. LUCIS - Land Use Control Information System US ENG CONTROLS - Engineering Controls Sites List. US INST CONTROLS - Institutional Controls Sites List.

ERNS: ERNS Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances. ERNS - Emergency Response Notification System

Database Descriptions

State/Tribal CERCLIS: SHWS State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state. SHWS - This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list. DERR - Division of Emergency & Remedial Response's Database.

State/Tribal SWL: SWF/LF Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites. SWF/LF - Licensed Solid Waste Facilities

State/Tribal LTANKS: LUST Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. LUST - Leaking Underground Storage Tank File INDIAN LUST R9 - Leaking Underground Storage Tanks on Indian Land. INDIAN LUST R7 - Leaking Underground Storage Tanks on Indian Land. INDIAN LUST R8 - Leaking Underground Storage Tanks on Indian Land. INDIAN LUST R10 - Leaking Underground Storage Tanks on Indian Land. INDIAN LUST R6 - Leaking Underground Storage Tanks on Indian Land. INDIAN LUST R5 - Leaking Underground Storage Tanks on Indian Land. INDIAN LUST R4 - Leaking Underground Storage Tanks on Indian Land. INDIAN LUST R1 - Leaking Underground Storage Tanks on Indian Land. UNREG LTANKS - Ohio Leaking UST File.

State/Tribal Tanks: FEMA UST A listing of all FEMA owned underground storage tanks. FEMA UST - Underground Storage Tank Listing UST - Underground Storage Tank Tank File. AST - Above Ground Storage Tanks. INDIAN UST R8 - Underground Storage Tanks on Indian Land. INDIAN UST R5 - Underground Storage Tanks on Indian Land. INDIAN UST R9 - Underground Storage Tanks on Indian Land. INDIAN UST R6 - Underground Storage Tanks on Indian Land. INDIAN UST R1 - Underground Storage Tanks on Indian Land. INDIAN UST R7 - Underground Storage Tanks on Indian Land. INDIAN UST R4 - Underground Storage Tanks on Indian Land. INDIAN UST R10 - Underground Storage Tanks on Indian Land.

State/Tribal IC / EC: HIST ENG CONTROLS HIST INST CONTROLS - Institutional Controls Database. "Institutional control" is a restriction that is recorded in the same manner as a deed which limits access to or use of the property such that exposure to hazardous substances or petroleum are effectively and reliably eliminated or mitigated. Examples of institutional controls include land and water use restrictions. This database is no longer updated or maintained by the state agency. HIST INST CONTROLS - Institutional Controls Database ENG CONTROLS - Sites with Engineering Controls. INST CONTROL - Sites with Institutional Engineering Controls.

State/Tribal VCP: INDIAN VCP R1 INDIAN VCP R7 - Voluntary Cleanup Priority Lisitng. VCP - Voluntary Action Program Sites. Site involved in the Voluntary Action Program. VCP - Voluntary Action Program Sites

ST/Tribal Brownfields: BROWNFIELDS A statewide brownfields inventory. A brownfield is an abandoned, idled or under-used industrial or commercial property where expansion or redevelopment is complicated by known or potential releases of hazardous substances and/or petroleum. BROWNFIELDS - Ohio Brownfield Inventory

US Brownfields: US BROWNFIELDS Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs. US BROWNFIELDS - A Listing of Brownfields Sites

Database Descriptions

Other SWF: HIST LF A list of about 1200 old abandoned dumps or landfills. This database was developed from Ohio EPA staff notebooks and other information dating from the mid-1970s HIST LF - Old Solid Waste Landfill INDIAN ODI - Report on the Status of Open Dumps on Indian Lands. ODI - Open Dump Inventory.

Other Tanks: ARCHIVE UST Underground storage tank records that have been removed from the Underground Storage Tank database. ARCHIVE UST - Archived Underground Storage Tank Sites

Spills: SPILLS Incidents reported to the Emergency Response Unit. The focus of the ER program is to minimize the impact on the environment from accidental releases, spills, and unauthorized discharges from any fixed or mobile sources. Incidents involving petroleum products, hazardous materials, hazardous waste, abandoned drums, or other materials which may pose as a pollution threat to the state?s water, land, or air should be reported immediately. Not all incidents included in the database are actual SPILLS, they can simply be reported incidents. SPILLS - Emergency Response Database

Other: RCRA NonGen / NLR RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste. RCRA NonGen / NLR - RCRA - Non Generators / No Longer Regulated FEDLAND - Federal and Indian Lands. SCRD DRYCLEANERS - State Coalition for Remediation of Drycleaners Listing. TRIS - Toxic Chemical Release Inventory System. PRP - Potentially Responsible Parties. RADINFO - Radiation Information Database. BRS - Biennial Reporting System. INDIAN RESERV - Indian Reservations. UMTRA - Uranium Mill Tailings Sites. LEAD SMELTER 1 - Lead Smelter Sites. LEAD SMELTER 2 - Lead Smelter Sites. US AIRS (AFS) - Aerometric Information Retrieval System Facility Subsystem (AFS). US AIRS MINOR - Air Facility System Data. US MINES - Mines Master Index File. MINES VIOLATIONS - MSHA Violation Assessment Data. US MINES 2 - Ferrous and Nonferrous Metal Mines Database Listing. US MINES 3 - Active Mines & Mineral Plants Database Listing. MINES MRDS - Mineral Resources Data System. ABANDONED MINES - Abandoned Mines. PFAS NPL - Superfund Sites with PFAS Detections Information. PFAS FEDERAL SITES - Federal Sites PFAS Information. PFAS TSCA - PFAS Manufacture and Imports Information. PFAS TRIS - List of PFAS Added to the TRI. PFAS RCRA MANIFEST - PFAS Transfers Identified In the RCRA Database Listing. PFAS ATSDR - PFAS Contamination Site Location Listing. PFAS WQP - Ambient Environmental Sampling for PFAS. PFAS PROJECT - NORTHEASTERN UNIVERSITY PFAS PROJECT. PFAS NPDES - Clean Water Act Discharge Monitoring Information. PFAS ECHO - Facilities in Industries that May Be Handling PFAS Listing. PFAS ECHO FIRE TRAIN - Facilities in Industries that May Be Handling PFAS Listing. PFAS PT 139 AIRPORT - All Certified Part 139 Airports PFAS Information Listing. AQUEOUS FOAM NRC - Aqueous Foam Related Incidents Listing. PCS ENF - Enforcement data. PCS - Permit Compliance System. BIOSOLIDS - ICIS-NPDES Biosolids Facility Data. UST FINDER RELEASE - UST Finder Releases Database. UST FINDER - UST Finder Database. E MANIFEST - Hazardous Waste Electronic Manifest System. PFAS - PFOA & PFOS Site Listing. AIRS - Title V Permits Listing. DRYCLEANERS - Drycleaner Facility Listing. LEAD - Lead Inspections Listing. VAPOR - Vapor Intrusion. BIOSOLIDS - Biosolids Information Listing.

EDR Exclusive: EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. BIOSOLIDS - EDR Exclusive Historical Auto Stations EDR MGP - EDR Proprietary Manufactured Gas Plants. EDR Hist Auto - EDR Exclusive Historical Auto Stations. EDR Hist Cleaner - EDR Exclusive Historical Cleaners.

Database Descriptions

Exclusive Recovered Govt. Archives: RGA LF The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Ohio Environmental Procetion Agency in Ohio. RGA LF - Recovered Government Archive Solid Waste Facilities List RGA LUST - Recovered Government Archive Leaking Underground Storage Tank.

Database Sources

NPL: EPA
Updated Quarterly

NPL Delisted: EPA
Updated Quarterly

CERCLIS: Environmental Protection Agency
Varies

NFRAP: EPA
Updated Quarterly

RCRA COR ACT: EPA
Updated Quarterly

RCRA TSD: Environmental Protection Agency
Updated Quarterly

RCRA GEN: Environmental Protection Agency
Updated Quarterly

Federal IC / EC: Department of the Navy
Varies

ERNS: National Response Center, United States Coast Guard
Updated Quarterly

State/Tribal CERCLIS: Ohio EPA
No Update Planned

State/Tribal SWL: Ohio Environmental Protection Agency
Updated Semi-Annually

State/Tribal LTANKS: Department of Commerce
Updated Quarterly

State/Tribal Tanks: FEMA
Varies

Database Sources

State/Tribal IC / EC: Ohio EPA
No Update Planned

State/Tribal VCP: EPA, Region 7
Varies

ST/Tribal Brownfields: Ohio EPA
Updated Quarterly

US Brownfields: Environmental Protection Agency
Updated Semi-Annually

Other SWF: Ohio EPA
No Update Planned

Other Tanks: Department of Commerce, Division of State Fire Marshal
Updated Quarterly

Spills: Ohio EPA
Updated Semi-Annually

Other: Environmental Protection Agency
Updated Quarterly

EDR Exclusive: EDR, Inc.
No Update Planned

Exclusive Recovered Govt. Archives: Ohio Environmental Protection Agency
Varies

Street Name Report for Streets near the Target Property

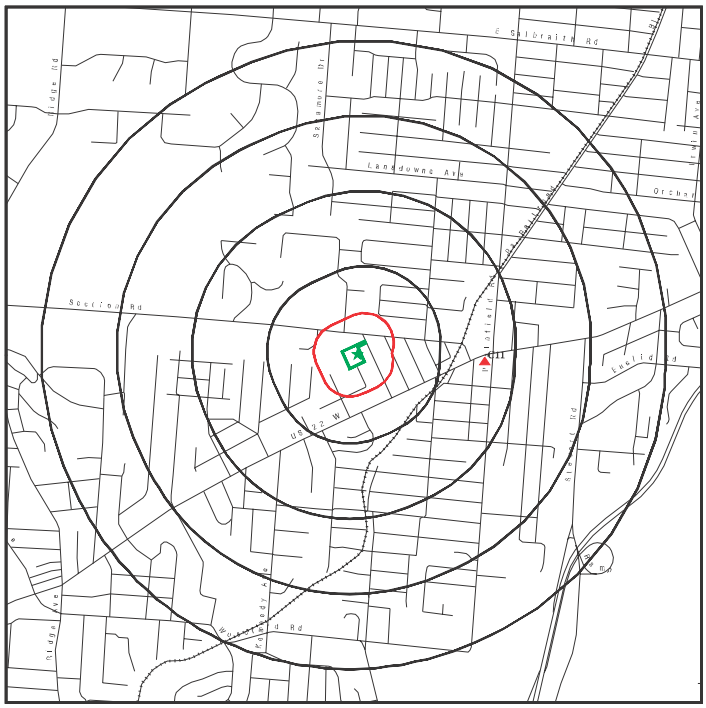
Target Property: 6783 SIEBERN AVENUE
CINCINNATI, OH 45236

JOB: HPS-ENV1

Street Name	Dist/Dir	Street Name	Dist/Dir
Afton Ave	0.22 West		
Amberacres Dr	0.14 WNW		
Belkenton Ave	0.11 SW		
Gatewood Ln	0.20 NNE		
Gerdsen Dr	0.21 North		
Grace Ave	0.11 SSE		
Hampton Dr	0.19 South		
Iris Ave	0.16 WSW		
Kenton Ave	0.16 ENE		
N Broadlawn Cir	0.20 NNE		
Ohio Ave	0.23 ENE		
Park Ave	0.11 ENE		
Placid Pl	0.04 South		
S Broadlawn Cir	0.15 NNE		
Section Rd	0.07 North		
Siebern Ave	0.04 ENE		
US-22 W	0.18 SSE		
Winding Way	0.09 NNW		

Environmental FirstSearch
1.000 Mile Radius
ASTM MAP: NPL, RCRACOR, STATES Sites

6783 SIEBERN AVENUE CINCINNATI, OH 45236



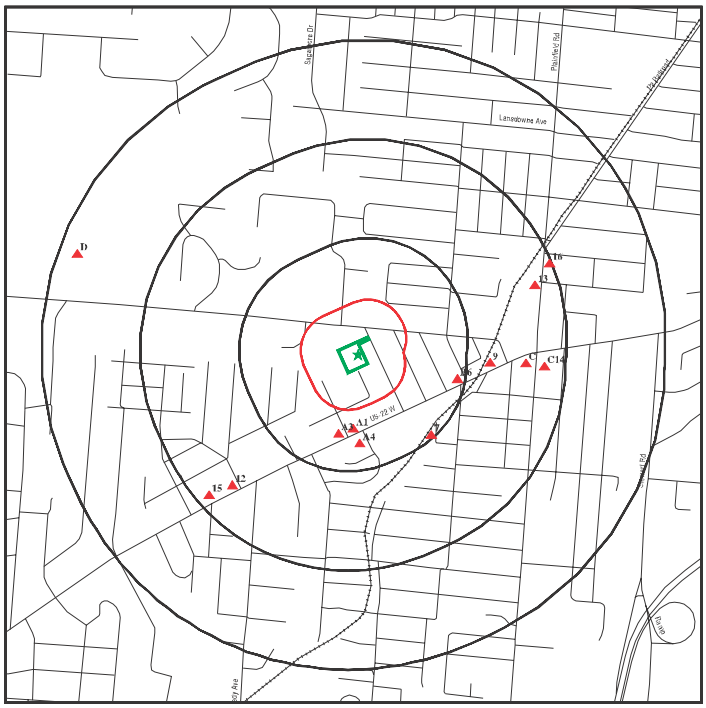
Black Rings Represent Qtr. Mile Radius; Red Ring Represents 500 ft. Radius
★ Target Property (Latitude: 39.193256 Longitude: 84.408971)
▲ Identified Sites
Indian Reservations BIA
National Priority List Sites

EDR Reference Code (EDR Internal use only): 8118979.2s
Copyright © 2020 EDR, Inc. © 2016 TomTom Rel. 2015.
25-08-24 13:04:35 Wed

Environmental FirstSearch

0.750 Mile Radius
ASTM MAP: CERCLIS, RCRATSD, LUST, SWL

6783 SIEBERN AVENUE CINCINNATI, OH 45236



Black Rings Represent Qtr. Mile Radius; Red Ring Represents 500 ft. Radius

- Target Property (Latitude: 39.193256 Longitude: 84.408971)
- Identified Sites
- Indian Reservations BIA
- National Priority List Sites

EDR Reference Code (EDR Internal use only): 8118979.2s
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25-09-24.13x04x51.Wed

Environmental FirstSearch

0.25 Mile Radius
ASTM MAP: RCRAGEN, ERNS, UST, FED IC/EC, METH LABS

6783 SIEBERN AVENUE CINCINNATI, OH 45236

Black Rings Represent Qtr. Mile Radius; Red Ring Represents 500 ft. Radius

- Target Property (Latitude: 39.193256 Longitude: 84.408971)
- Identified Sites
- Indian Reservations BIA
- National Priority List Sites

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25-09-24.13x05x05.Wed

Environmental FirstSearch

0.25 Mile Radius
Non ASTM Map, Spills, FINDS

6783 SIEBERN AVENUE CINCINNATI, OH 45236

Black Rings Represent Qtr. Mile Radius; Red Ring Represents 500 ft. Radius

- Target Property (Latitude: 39.193256 Longitude: 84.408971)
- Identified Sites
- Indian Reservations BIA
- Sensitive Receptors
- National Priority List Sites

EDR Reference Code (EDR Internal use only): 8118979.2s
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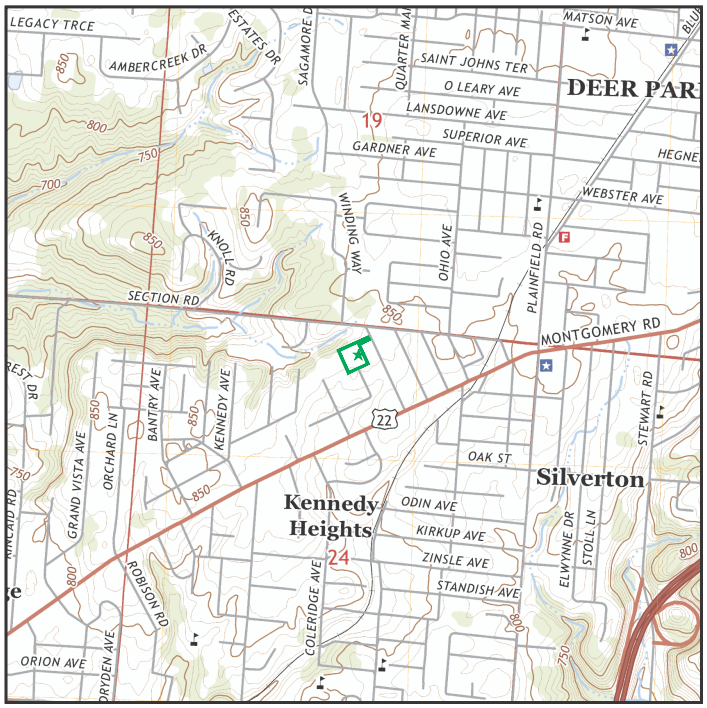
25-09-24.13x05x22.Wed

Site location Map

Topo: 0.75 Mile Radius

6783 SIEBERN AVENUE CINCINNATI, OH 45236



Map Image Position: TP
Map Reference Code & Name: 14434912 Cincinnati East
Map State(s): OH
Version Date: 2019

EDR Reference Code (EDR Internal use only): 8118979.2s
25-09-24.13x05x35.Wed

St. Theresa Village
6783 Siebern Avenue
CINCINNATI, OH 45236

Inquiry Number: 8118979.2s
September 29, 2025

EDR Vapor Encroachment Screen

Prepared using EDR's Vapor Encroachment Worksheet

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by EDR. The report was designed to assist parties seeking to meet the search requirements of the ASTM Standard Practice for Assessment of Vapor Encroachment into Structures on Property Involved in Real Estate Transactions (E 2600).

STANDARD ENVIRONMENTAL RECORDS	Default Area of Concern (Miles)*	property	1/10	> 1/10
Lists of Federal NPL (Superfund) sites	1.0	0	0	0
Lists of Federal Delisted NPL sites	0.5	0	0	0
Lists of Federal sites subject to CERCLA removals and CERCLA orders	0.5	0	0	0
Lists of Federal CERCLA sites with NFRAP	0.5	0	0	0
Lists of Federal RCRA facilities undergoing Corrective Action	1.0	0	0	0
Lists of Federal RCRA TSD facilities	0.5	0	0	0
Lists of Federal RCRA generators	0.25	0	0	0
Federal institutional controls / engineering controls registries	0.125	0	0	0
Federal ERNS list	0.125	0	0	0
Lists of state- and tribal (Superfund) equivalent sites	not searched	-	-	-
Lists of state- and tribal hazardous waste facilities	1.0	0	0	0
Lists of state and tribal landfills and solid waste disposal facilities	0.75	0	0	0
Lists of state and tribal leaking storage tanks	0.5	0	0	0
Lists of state and tribal registered storage tanks	0.25	0	0	0
State and tribal institutional control / engineering control registries	0.125	0	0	0
Lists of state and tribal voluntary cleanup sites	0.5	0	0	0
Lists of state and tribal brownfield sites	0.5	0	0	0

ADDITIONAL ENVIRONMENTAL RECORDS				
Local Brownfield lists	0.5	0	0	0
Local Lists of Landfill / Solid Waste Disposal Sites	0.75	0	0	0
Local Lists of Hazardous waste / Contaminated Sites	not searched	-	-	-
Local Lists of Registered Storage Tanks	0.125	0	0	0
Local Land Records	not searched	-	-	-
Records of Emergency Release Reports	0.125	0	0	0
Other Ascertainable Records	1.0	0	0	0

EDR HIGH RISK HISTORICAL RECORDS				
EDR Exclusive Records	0.125	0	0	0
Exclusive Recovered Govt. Archives	property	0	-	-

EXECUTIVE SUMMARY

EDR RECOVERED GOVERNMENT ARCHIVES

EDR Exclusive Records	0.125	0	0	0
Exclusive Recovered Govt. Archives	property	0	-	-

*The Default Area of Concern may be adjusted by the environmental professional using experience and professional judgement. Each category may include several databases, and each database may have a different distance. A list of individual databases is provided at the back of this report.

EXECUTIVE SUMMARY

TARGET PROPERTY INFORMATION

ADDRESS

ST. THERESA VILLAGE
6783 SIEBERN AVENUE
CINCINNATI, OH 45236

COORDINATES

Latitude (North):	39.193256 - 39° 11′ 35.72296″
Longitude (West):	84.408971 - 84° 24′ 32.305298″
Elevation:	841 ft. above sea level

EXECUTIVE SUMMARY

SEARCH RESULTS

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Name	Address	Dist/Dir	Map ID	Page
Not Reported				

ADDITIONAL ENVIRONMENTAL RECORDS

Name	Address	Dist/Dir	Map ID	Page
Not Reported				

EDR HIGH RISK HISTORICAL RECORDS

Name	Address	Dist/Dir	Map ID	Page
Not Reported				

EDR RECOVERED GOVERNMENT ARCHIVES

Name	Address	Dist/Dir	Map ID	Page
Not Reported				

PRIMARY MAP - 8118979.2S

Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Indian Reservations BIA

Pipelines

0 300 1/3 Miles

SITE NAME: St. Theresa Village ADDRESS: 6783 Siebern Avenue CINCINNATI OH 45236 LAT/LONG: 39.193256 / 84.408971	CLIENT: Dominion Environmental Group, Inc CONTACT: Dana M Pelkey INQUIRY #: 8118979.2s DATE: September 24, 2025 1:06 pm

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SECONDARY MAP - 8118979.2S

Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

0 1/3 1/2 1 Miles

Indian Reservations BIA

Pipelines

Upgradient Area

SITE NAME:	St. Theresa Village	CLIENT:	Dominion Environmental Group, Inc
ADDRESS:	6783 Siebern Avenue CINCINNATI OH 45236	CONTACT:	Dana M Pelkey
LAT/LONG:	39.193256 / 84.408971	INQUIRY #:	8118979.2s
		DATE:	September 24, 2025 1:05 pm

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MAP FINDINGS

LEGEND

FACILITY NAME **FACILITY ADDRESS, CITY, ST, ZIP**			EDR SITE ID NUMBER
◆ **MAP ID#**	Direction Distance Range Relative Elevation	(Distance feet / miles) Feet Above Sea Level	ASTM 2600 Record Sources found in this report. Each database searched has been assigned to one or more categories. For detailed information about categorization, see the section of the report Records Searched and Currency.
Worksheet: **Comments:** Comments may be added on the online Vapor Encroachment Worksheet.			

DATABASE ACRONYM: Applicable categories (A hoverbox with database description).

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
ENVIRONMENTAL RECORDS						
Federal NPL site list						
US	NPL	National Priority List	EPA	06/26/2025	07/01/2025	07/17/2025
US	Proposed NPL	Proposed National Priority List Sites	EPA	06/26/2025	07/01/2025	07/17/2025
US	NPL LIENS	Federal Superfund Liens	EPA	10/15/1991	02/02/1994	03/30/1994
Federal CERCLIS list						
US	SEMS	Superfund Enterprise Management System	EPA	06/26/2025	07/01/2025	07/17/2025
Federal RCRA CORRACTS facilities list						
US	CORRACTS	Corrective Action Report	EPA	06/02/2025	06/03/2025	06/16/2025
Federal RCRA TSD facilities list						
US	RCRA-TSDF	RCRA - Treatment, Storage and Disposal	Environmental Protection Agency	06/02/2025	06/04/2025	06/16/2025
Federal RCRA generators list						
US	RCRA-LQG	RCRA - Large Quantity Generators	Environmental Protection Agency	06/02/2025	06/04/2025	06/16/2025
US	RCRA-SQG	RCRA - Small Quantity Generators	Environmental Protection Agency	06/02/2025	06/04/2025	06/16/2025
US	RCRA-VSQG	RCRA - Very Small Quantity Generators (Formerly Conditionall	Environmental Protection Agency	06/02/2025	06/04/2025	06/16/2025
Federal institutional controls / engineering controls registries						
US	LUCIS	Land Use Control Information System	Department of the Navy	03/11/2025	04/02/2025	06/24/2025
US	US ENG CONTROLS	Engineering Controls Sites List	Environmental Protection Agency	05/19/2025	05/20/2025	07/29/2025
US	US INST CONTROLS	Institutional Controls Sites List	Environmental Protection Agency	05/19/2025	05/20/2025	07/29/2025
Federal ERNS list						
US	ERNS	Emergency Response Notification System	National Response Center, United States Coast	06/10/2025	06/12/2025	06/16/2025
State and tribal - equivalent CERCLIS						
OH	SHWS	This state does not maintain a SHWS list. See the Federal CE	Ohio EPA			
OH	DERR	Division of Emergency & Remedial Response's Database	Ohio EPA	03/21/2025	04/29/2025	07/23/2025
State and tribal landfill / solid waste disposal						
OH	SWF/LF	Licensed Solid Waste Facilities	Ohio Environmental Protection Agency	06/30/2025	06/30/2025	09/22/2025
State and tribal leaking storage tank lists						
OH	LUST	Leaking Underground Storage Tank File	Department of Commerce	05/05/2025	05/07/2025	07/23/2025
US	INDIAN LUST R9	Leaking Underground Storage Tanks on Indian Land	Environmental Protection Agency	01/07/2025	01/16/2025	04/07/2025
US	INDIAN LUST R7	Leaking Underground Storage Tanks on Indian Land	EPA Region 7	01/07/2025	01/16/2025	04/07/2025
US	INDIAN LUST R5	Leaking Underground Storage Tanks on Indian Land	EPA, Region 5	11/18/2024	01/16/2025	04/07/2025
US	INDIAN LUST R8	Leaking Underground Storage Tanks on Indian Land	EPA Region 8	11/18/2024	01/16/2025	04/07/2025
US	INDIAN LUST R10	Leaking Underground Storage Tanks on Indian Land	EPA Region 10	11/18/2024	01/16/2025	04/07/2025
US	INDIAN LUST R1	Leaking Underground Storage Tanks on Indian Land	EPA Region 1	11/18/2024	01/16/2025	04/07/2025
US	INDIAN LUST R4	Leaking Underground Storage Tanks on Indian Land	EPA Region 4	11/18/2024	01/16/2025	04/07/2025
US	INDIAN LUST R6	Leaking Underground Storage Tanks on Indian Land	EPA Region 6	11/18/2024	01/16/2025	04/07/2025

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
OH	UNREG LTANKS	Ohio Leaking UST File	Department of Commerce	08/25/1999	08/19/2003	08/26/2003
State and tribal registered storage tank lists						
OH	UST	Underground Storage Tank Tank File	Department of Commerce	05/05/2025	05/06/2025	07/23/2025
OH	AST	Above Ground Storage Tanks	Department of Commerce	04/18/2025	04/18/2025	07/09/2025
US	INDIAN UST R1	Underground Storage Tanks on Indian Land	EPA, Region 1	11/18/2024	01/16/2025	04/07/2025
US	INDIAN UST R8	Underground Storage Tanks on Indian Land	EPA Region 8	11/18/2024	01/16/2025	04/07/2025
US	INDIAN UST R5	Underground Storage Tanks on Indian Land	EPA Region 5	11/18/2024	01/16/2025	04/07/2025
US	INDIAN UST R6	Underground Storage Tanks on Indian Land	EPA Region 6	11/18/2024	01/16/2025	04/07/2025
US	INDIAN UST R7	Underground Storage Tanks on Indian Land	EPA Region 7	01/07/2025	01/16/2025	04/07/2025
US	INDIAN UST R9	Underground Storage Tanks on Indian Land	EPA Region 9	10/15/2024	01/16/2025	04/07/2025
US	INDIAN UST R4	Underground Storage Tanks on Indian Land	EPA Region 4	11/08/2024	01/16/2025	04/07/2025
US	INDIAN UST R10	Underground Storage Tanks on Indian Land	EPA Region 10	11/18/2024	01/16/2025	04/07/2025
US	FEMA UST	Underground Storage Tank Listing	FEMA	04/08/2025	04/23/2025	04/24/2025
State and tribal institutional control / engineering control registries						
OH	HIST INST CONTROLS	Institutional Controls Database	Ohio EPA	05/10/2005	04/06/2006	05/04/2006
OH	HIST ENG CONTROLS	Operation & Maintenance Agreements Database	Ohio EPA	05/10/2005	04/04/2006	05/04/2006
OH	ENG CONTROLS	Sites with Engineering Controls	Ohio EPA	03/21/2025	04/29/2025	07/23/2025
OH	INST CONTROL	Sites with Institutional Engineering Controls	Ohio Environmental Protection Agency	03/21/2025	04/29/2025	07/23/2025
State and tribal voluntary cleanup sites						
US	INDIAN VCP R7	Voluntary Cleanup Priority Lisitng	EPA, Region 7	03/20/2008	04/22/2008	05/19/2008
US	INDIAN VCP R1	Voluntary Cleanup Priority Listing	EPA, Region 1	07/27/2015	09/29/2015	02/18/2016
OH	VCP	Voluntary Action Program Sites	Ohio EPA, Voluntary Action Program	03/21/2025	04/29/2025	07/23/2025
State and tribal Brownfields sites						
OH	BROWNFIELDS	Ohio Brownfield Inventory	Ohio EPA	06/02/2025	06/02/2025	08/27/2025
Other Records						
OH	HIST LF	Old Solid Waste Landfill	Ohio EPA	09/23/2024	12/04/2024	02/27/2025
OH	ARCHIVE UST	Archived Underground Storage Tank Sites	Department of Commerce, Division of State Fir	05/05/2025	05/06/2025	07/23/2025
US	US AIRS (AFS)	Aerometric Information Retrieval System Facility Subsystem (	EPA	10/12/2016	10/26/2016	02/03/2017
US	LEAD SMELTER 2	Lead Smelter Sites	American Journal of Public Health	04/05/2001	10/27/2010	12/02/2010
US	US AIRS MINOR	Air Facility System Data	EPA	10/12/2016	10/26/2016	02/03/2017
US	SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing	Environmental Protection Agency	07/30/2021	02/03/2023	02/10/2023
US	LEAD SMELTER 1	Lead Smelter Sites	Environmental Protection Agency	06/26/2025	07/01/2025	07/17/2025
US	Delisted NPL	National Priority List Deletions	EPA	06/26/2025	07/01/2025	07/17/2025
US	SEMS-ARCHIVE	Superfund Enterprise Management System Archive	EPA	06/26/2025	07/01/2025	07/17/2025
US	RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated	Environmental Protection Agency	06/02/2025	06/04/2025	06/16/2025
US	US BROWNFIELDS	A Listing of Brownfields Sites	Environmental Protection Agency	09/09/2024	09/11/2024	12/06/2024
US	FEDLAND	Federal and Indian Lands	U.S. Geological Survey	04/02/2018	04/11/2018	11/06/2019
US	UMTRA	Uranium Mill Tailings Sites	Department of Energy	05/15/2025	05/15/2025	07/29/2025
US	ODI	Open Dump Inventory	Environmental Protection Agency	06/30/1985	08/09/2004	09/17/2004
US	MINES VIOLATIONS	MSHA Violation Assessment Data	DOL, Mine Safety & Health Admi	04/01/2025	04/02/2025	06/24/2025
US	US MINES	Mines Master Index File	Department of Labor, Mine Safety and Health A	05/01/2025	05/20/2025	07/29/2025
US	US MINES 2	Ferrous and Nonferrous Metal Mines Database Listing	USGS	04/08/2025	05/20/2025	08/12/2025

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
US	US MINES 3	Active Mines & Mineral Plants Database Listing	USGS	04/14/2011	06/08/2011	09/13/2011
US	PRP	Potentially Responsible Parties	EPA	06/26/2025	07/01/2025	07/29/2025
US	TRIS	Toxic Chemical Release Inventory System	EPA	12/31/2023	02/11/2025	02/18/2025
US	RADINFO	Radiation Information Database	Environmental Protection Agency	07/01/2019	07/01/2019	09/23/2019
US	BRS	Biennial Reporting System	EPA/NTIS	12/31/2023	02/19/2025	03/07/2025
US	PWS	Public Water System Data	EPA	12/17/2013	01/09/2014	10/15/2014
US	INDIAN RESERV	Indian Reservations	USGS	12/31/2014	07/14/2015	01/10/2017
US	INDIAN ODI	Report on the Status of Open Dumps on Indian Lands	Environmental Protection Agency	12/31/1998	12/03/2007	01/24/2008
US	ABANDONED MINES	Abandoned Mines	Department of Interior	05/28/2025	05/28/2025	06/03/2025
OH	AIRS	Title V Permits Listing	Ohio EPA	06/09/2025	06/11/2025	09/04/2025
OH	DRYCLEANERS	Drycleaner Facility Listing	Ohio EPA	06/13/2025	06/13/2025	09/08/2025
OH	LEAD	Lead Inspections Listing	Department of Health	06/09/2025	06/10/2025	09/04/2025
OH	SPILLS	Emergency Response Database	Ohio EPA	04/21/2025	04/29/2025	07/22/2025
OH	VAPOR	Vapor Intrusion	Ohio EPA	06/16/2020	06/18/2020	09/01/2020
US	PFAS NPDES	Clean Water Act Discharge Monitoring Information	Environmental Protection Agency	06/23/2025	06/26/2025	08/27/2025
US	PFAS ATSDR	PFAS Contamination Site Location Listing	Department of Health & Human Services	06/24/2020	03/17/2021	11/08/2022
US	E MANIFEST	Hazardous Waste Electronic Manifest System	Environmental Protection Agency	06/02/2025	06/04/2025	08/13/2025
US	PFAS TSCA	PFAS Manufacture and Imports Information	Environmental Protection Agency	06/23/2025	06/26/2025	08/27/2025
US	AQUEOUS FOAM NRC	Aqueous Foam Related Incidents Listing	Environmental Protection Agency	06/23/2025	06/26/2025	08/27/2025
OH	PFAS	PFOA & PFOS Site Listing	Ohio EPA	06/04/2024	06/26/2024	09/18/2024
US	BIOSOLIDS	ICIS-NPDES Biosolids Facility Data	Environmental Protection Agency	04/13/2025	04/15/2025	07/08/2025
US	PFAS PROJECT	NORTHEASTERN UNIVERSITY PFAS PROJECT	Social Science Environmental Health Research	05/15/2024	03/06/2025	06/03/2025
US	MINES MRDS	Mineral Resources Data System	USGS	06/04/2024	11/22/2024	02/18/2025
US	PFAS ECHO	Facilities in Industries that May Be Handling PFAS Listing	Environmental Protection Agency	06/23/2025	06/26/2025	08/27/2025
US	PFAS NPL	Superfund Sites with PFAS Detections Information	Environmental Protection Agency	06/23/2025	06/26/2025	08/27/2025
US	PFAS PT 139 AIRPORT	All Certified Part 139 Airports PFAS Information Listing	Environmental Protection Agency	06/23/2025	06/26/2025	08/27/2025
US	UST FINDER	UST Finder Database	Environmental Protection Agency	06/08/2023	10/04/2023	01/18/2024
US	UST FINDER RELEASE	UST Finder Releases Database	Environmental Protecton Agency	06/08/2023	10/31/2023	01/18/2024
US	PCS	Permit Compliance System	EPA, Office of Water	12/16/2016	01/06/2017	03/10/2017
OH	BIOSOLIDS	Biosolids Information Listing	Ohio Environmental Protection Agency	04/07/2025	05/27/2025	08/21/2025
US	FEDERAL FACILITY	Federal Facility Site Information listing	Environmental Protection Agency	05/05/2025	06/20/2025	08/27/2025
US	PFAS ECHO FIRE TRAIN	Facilities in Industries that May Be Handling PFAS Listing	Environmental Protection Agency	06/23/2025	06/26/2025	08/27/2025
US	PFAS FEDERAL SITES	Federal Sites PFAS Information	Environmental Protection Agency	06/23/2025	06/26/2025	08/27/2025
US	PFAS TRIS	List of PFAS Added to the TRI	Environmental Protection Agency	06/23/2025	06/26/2025	08/27/2025
US	PFAS RCRA MANIFEST	PFAS Transfers Identified In the RCRA Database Listing	Environmental Protection Agency	03/23/2025	04/02/2025	05/05/2025
US	PFAS WQP	Ambient Environmental Sampling for PFAS	Environmental Protection Agency	06/23/2025	06/26/2025	08/27/2025

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
HISTORICAL USE RECORDS						
US	EDR MGP	EDR Proprietary Manufactured Gas Plants	EDR, Inc.			
US	EDR Hist Auto	EDR Exclusive Historical Auto Stations	EDR, Inc.			
US	EDR Hist Cleaner	EDR Exclusive Historical Cleaners	EDR, Inc.			
OH	RGA LF	Recovered Government Archive Solid Waste Facilities List	Ohio Environmental Protection Agency		07/01/2013	01/13/2014
OH	RGA LUST	Recovered Government Archive Leaking Underground Storage Tan	Department of Commerce		07/01/2013	12/20/2013

STREET AND ADDRESS INFORMATION

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Appendix F:

Interview Documentation

User Questionnaire

SUBJECT PROPERTY NAME:	St. Theresa Village
SUBJECT PROPERTY ADDRESS:	6783 Siebern Avenue

QUESTION	YES	NO	UNK
1. Did a search of recorded land title records (or judicial records where appropriate) identify any environmental liens filed or recorded against the property under federal, tribal, state or local law?		X	
2. Did a search of recorded land title records (or judicial records where appropriate) identify any Activity and Use Limitations (AULs), such as engineering controls, land use restrictions or institutional controls that are in place at the property and/or have been filed or recorded against the property under federal, tribal, state or local law?		X	
3. Are you aware of any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products?		X	
4. Are you aware of any pending, threatened, or past litigation and/or administrative proceedings relevant to hazardous substances or petroleum products, in, on or from the subject property?		X	
5. Do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?		X	
6. Do you know the past uses of the property?		X	
7. Do you know specific chemicals that are present or once were present at the property?		X	
8. Do you know of spills or other chemical releases that have taken place at the property?		X	
9. Do you know of environmental cleanups that have taken place at the property?		X	
10. Based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of releases at the property?		X	
11. Is the property or has the property been used as a gasoline station, motor repair facility, commercial printing, dry cleaners, photo developing, landfill, industrial use, waste treatment or disposal facility?			X
12. Are you aware of fill dirt that has been brought onto the subject property that originated from a contaminated site or that is of an unknown origin?		X	
13. Are there currently, or to the best of your knowledge have there been previously, any registered or unregistered storage tanks (above or underground) located on the subject property?			X
14. Are there existing or proposed stationary tanks containing explosive or fire-prone materials of 100 gallons or larger on the site or nearby the site?			X
15. Are there monitoring wells at the subject property?			X
16. Are you aware of any asbestos-containing materials (ACMs) at the subject property?		X	
17. Are you aware of the existence of radon mitigation systems at the subject property? If so, please provide documentation (i.e. types of systems installed, when/who installed, which units mitigated, most recent testing results, copy of Radon OM&M, etc.).		X	
18a. Does the purchase price being paid for this property reasonably reflect the fair market value of the property?	X		
18b. If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property?			NA
19. Has a title search been performed? If yes, please attach.	X		
20. What type of property transaction is being performed? i.e. sale, purchase, transfer, refinance?	purchase and sale		
21. If you are also the current landowner, in what year did you purchase the subject property?	NA		

Please return to D3G: fax 804-621-2244 or mail it to 201 Wylderose Drive, Midlothian, VA 23113

Timothy R. Westrich		10-10-2025
PRINT NAME	**SIGNATURE**	**DATE**

National Church Residences	1
TITLE/COMPANY	**YEARS WITH PROPERTY**

Docusign Envelope ID: 24C04AC9-8EBE-4ACA-8FF1-AA1B436BF49A

CURRENT LANDOWNER QUESTIONNAIRE

SUBJECT PROPERTY NAME:	St. Theresa Village
SUBJECT PROPERTY ADDRESS:	6783 Siebern Avenue

QUESTION	YES	NO	UNK
1. Did a search of recorded land title records (or judicial records where appropriate) identify any environmental liens filed or recorded against the property under federal, tribal, state or local law?		X	
2. Did a search of recorded land title records (or judicial records where appropriate) identify any Activity and Use Limitations (AULs), such as engineering controls, land use restrictions or institutional controls that are in place at the property and/or have been filed or recorded against the property under federal, tribal, state or local law?		X	
3. Are you aware of any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products?		X	
4. Are you aware of any pending, threatened, or past litigation and/or administrative proceedings relevant to hazardous substances or petroleum products, in, on or from the subject property?		X	
5. Do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?		X	
6. Do you know the past uses of the property?			
7. Do you know specific chemicals that are present or once were present at the property?		X	
8. Do you know of spills or other chemical releases that have taken place at the property?		X	
9. Do you know of environmental cleanups that have taken place at the property?		X	
10. Based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of releases at the property?		X	
11. Is the property or has the property been used as a gasoline station, motor repair facility, commercial printing, dry cleaners, photo developing, landfill, industrial use, waste treatment or disposal facility?		X	
12. Are you aware of fill dirt that has been brought onto the subject property that originated from a contaminated site or that is of an unknown origin?		X	
13. Are there currently, or to the best of your knowledge have there been previously, any registered or unregistered storage tanks (above or underground) located on the subject property?		X	
14. Are there existing or proposed stationary tanks containing explosive or fire-prone materials of 100 gallons or larger on the site or nearby the site?		X	
15. Are there monitoring wells at the subject property?		X	
16. Is the subject property served by a private well and or a private septic system?		X	
17. Are you aware of any asbestos-containing materials (ACMs) at the subject property?		X	
18. Are you aware of the existence of radon mitigation systems at the subject property? If so, please provide documentation (i.e. types of systems installed, when/who installed, which units mitigated, most recent testing results, copy of Radon OM&M, etc.).		X	
19. What year did you purchase the subject property?	2012, but it was not a true sale it was an assumuption of Board control for each nonprofit corporation		

Please return to D3G: fax 804-621-2244 or mail it to 201 Wylderose Drive, Midlothian, VA 23113

Kassidi Boening	DocuSigned by: Kassidi Boening 31E5F3E24F31418	10/20/2025
PRINT NAME	**SIGNATURE**	**DATE**

Vice President	13 years
TITLE/COMPANY	**YEARS WITH PROPERTY**

KEY SITE MANAGER QUESTIONNAIRE

SUBJECT PROPERTY NAME:	St. Theresa Village
SUBJECT PROPERTY ADDRESS:	6783 Siebern Avenue

QUESTION	YES	NO	UNK
1. Did a search of recorded land title records (or judicial records where appropriate) identify any environmental liens filed or recorded against the property under federal, tribal, state or local law?			X
2. Did a search of recorded land title records (or judicial records where appropriate) identify any Activity and Use Limitations (AULs), such as engineering controls, land use restrictions or institutional controls that are in place at the property and/or have been filed or recorded against the property under federal, tribal, state or local law?			X
3. Are you aware of any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products?			X
4. Are you aware of any pending, threatened, or past litigation and/or administrative proceedings relevant to hazardous substances or petroleum products, in, on or from the subject property?			X
5. Do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?	X		
6. Do you know the past uses of the property?	X		
7. Do you know specific chemicals that are present or once were present at the property?		X	
8. Do you know of spills or other chemical releases that have taken place at the property?			X
9. Do you know of environmental cleanups that have taken place at the property?			X
10. Based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of releases at the property?		X	
11. Is the property or has the property been used as a gasoline station, motor repair facility, commercial printing, dry cleaners, photo developing, landfill, industrial use, waste treatment or disposal facility?		X	
12. Are you aware of fill dirt that has been brought onto the subject property that originated from a contaminated site or that is of an unknown origin?		X	
13. Are there currently, or to the best of your knowledge have there been previously, any registered or unregistered storage tanks (above or underground) located on the subject property?			X
14. Are there existing or proposed stationary tanks containing explosive or fire-prone materials of 100 gallons or larger on the site or nearby the site?		X	
15. Are there monitoring wells at the subject property?			X
16. Is the subject property served by a private well and or a private septic system?			X
17. Are you aware of any asbestos-containing materials (ACMs) at the subject property?			X
18. Are you aware of the existence of radon mitigation systems at the subject property? If so, please provide documentation (i.e. types of systems installed, when/who installed, which units mitigated, most recent testing results, copy of Radon OM&M, etc.).			X

Please return to D3G: fax 804-621-2244 or mail it to 201 Wylderose Drive, Midlothian, Virginia 23113

PRINT NAME	SIGNATURE	DATE
Tina Keller	Tina Keller	10-16-25

TITLE/COMPANY	YEARS WITH PROPERTY
National Church Residences	Less than 1.

Fire Contact:	Fire official	**From:** Compliance Department	
Municipality:	Hamilton County	**Department:**	Fire
Phone:	804-665-2902	**Fax:**	Email: comp@d3g.com
Pages:	2	**Date:**	09/11/2025

☒ Urgent ☐ For Review ☐ Please Comment ☒ Please Reply ☐ Please Recycle

To meet the financing requirements of the loan program, Dominion Due Diligence Group is requesting your assistance on behalf of:

National Church Residences
2245 North Bank Drive
Columbus, OH 43220

This information is required for the HUD re-financing report for the following property:

St. Theresa Village
6783 Siebern Avenue
Cincinnati, OH 45236

Please email completed letter to my attention at comp@d3g.com.

If unable to send via email, please fax to me at 804-588-5758 before mailing a hard copy to my attention.

Thank you for your time,

Compliance Department
P: 804-665-2902 F: 804-588-5758 E: comp@d3g.com

[2025-001881] **Initials:** CD

COMPLIANCE REQUEST:
Fire and Code Enforcement Verifications

Date: 09/11/2025

Completed By: Name & Title: _____
Department: _____
Direct Contact Info: _____

Re: Property: St. Theresa Village
Address: 6783 Siebern Avenue
City, State & Zip: Cincinnati, OH 45236

Requestor: National Church Residences
2245 North Bank Drive
Columbus, OH 43220

Dominion Due Diligence Group is requesting your assistance on behalf of the above referenced requestor. Please confirm whether the above noted subject property has any known outstanding fire code violations.

1. To the best of our knowledge, the property is free of any applicable code violations.

Yes No Reason: _____

2. **Last Inspection Date:** _____

If available, attach the inspection report. Please list the frequency in which inspections are required. If no inspections are required, please list municipality's policy:

_____

3. Are any permits available for former or current underground storage tanks?

Yes If yes, please attach all related information.

No If no, can you provide a department to contact for additional information.

4. Has the fire department responded to any hazmat spills at the property?

Yes If yes, please attach all related information.

No If no, can you provide a department to contact for additional information.

5. Are there any current or recent (within the past year) permits issued for thermal/explosive hazards (aboveground storage tanks >100 gallons) located within a one (1) mile radius of the subject property?

Yes If yes, please attach a copy of all available information. No

6. Has your jurisdiction adopted the 2017 edition (or newer) of the National Fire Protection Association (NFPA) 58 Liquefied Petroleum Gas Code?

Yes No

_____ _____

Fire Official Signature Date

Penelope Huhmann

From: Compliance Department
Sent: Tuesday, October 7, 2025 3:11 PM
To: sfm_codeenf@com.ohio.gov
Cc: Lexi Brass
Subject: FOIA Request -St. Theresa Village -OTTER Request

Apologies, I made some mistakes in my initial request email. Please respond to this one instead.
Thank you,

From: Compliance Department
Sent: Tuesday, October 7, 2025 3:06 PM
To: sfm_codeenf@com.ohio.gov
Cc: Lexi Brass <l.brass@d3g.com>
Subject: FOIA Request -St. Theresa Village -OTTER Request

Good afternoon,
I am writing in request of information that is needed for a re-financing loan report regarding St. Theresa Village, located at 6783 Siebern Avenue (PIN: 602-0001-0059-00 (2.171 AC) & 060200010432 (1.3 AC)) in Silverton, OH. I am requesting it on behalf of National Church Residences. Please let me know if more information is needed if fees are involved or if another municipality needs to be contacted.
I would like any permits for above/underground storage tanks for the address and parcel listed above.
Thank you,

DOMINION
DUE DILIGENCE

To: Hamilton County
Attn: Open Records Environmental Health
Date: 09/11/2025
Re: Project: St. Theresa Village
Address: 6783 Siebern Avenue Cincinnati, OH 45236
PIN: 602-0001-0059-00 (2.171 AC) & 060200010432 (1.3 AC)

As part of the real estate screening that we are performing at the above-listed property, I am requesting assistance to locate any environmental-related permits and information associated with the property.

Please answer the following questions:

Is any information for former or current wells or septic tanks available for the property?

☐ Yes If yes, please attach all related information

☐ No

If the answer to the above question is No, is the property located on City Sewer?

☐ Yes

☐ No

Are there any known Regional Health issues associated with this property?

☐ Yes If yes, please attach all related information

☐ No

Comments:

_____

_____

_____ _____
Signature Printed Name, Title

Thank you for your time and effort in completing the above request for information. If any more information is needed from our company regarding the screening that we are performing on the above property, please contact me at **(804) 665-2902**. I will follow up directly due to the timeliness of need for this information. Please fax this form and any additional information to me at **(804) 588-5758**.

Thanks for your time,

Compliance Department,
comp@d3g.com

Appendix G:

Special Contractual Conditions Between User and Environmental Professional

There are no special contractual conditions between the User and Environmental Professional:

D3G has no financial interest or family relationship with the officers, directors, stockholders or partners of the Borrower, the general contractor, any subcontractors, the buyer or seller of the proposed property or engage in any business that might present a conflict of interest.

D3G is employed under contract for this specific assignment and has no other side deals, agreements, or financial considerations with the Lender or others in connection with this transaction.

Appendix H:

Qualifications of the Environmental Professionals

EDWARD NIKOLICH

Property Needs Assessor
e.nikolich@d3g.com / 346-321-8013

EDUCATION

Loyola University, Chicago, IL

CERTIFICATIONS/REGISTRATIONS/TRAINING

- Texas Real Estate Commission Professional Inspector License
- Texas Commission on Environmental Quality Backflow Prevention Assembly Tester License
- US Environmental Protection Agency HVAC Technician Certificate
- International Association of Certified Indoor Air Consultants Mold Inspector Certificate
- Texas Dept. of Licensing Registered Air Conditioning Refrigeration Technician
- City of Houston Boiler Operator's Permit
- FHA Requirement 7 Training Certificate

SUMMARY OF EXPERIENCE

Ed Nikolich is a Property Needs Assessor for Dominion Due Diligence Group. Mr. Nikolich is directly responsible for conducting and preparing Property Condition Reports and Capital Needs Assessments performed throughout the United States. Prior to joining Dominion Due Diligence Group, Mr. Nikolich owned his own inspection company and conducted inspections for all housing types, including single and multifamily dwelling units. His services included overall property assessments, testing for indoor air quality, water quality, swimming pool conditions, appliances, roofing and other building components. Mr. Nikolich managed and operated multifamily buildings in Chicago and Houston with a portfolio of over twenty buildings. Mr. Nikolich maintained building components including boilers, chillers, fire suppression systems, plumbing systems, cooling towers, elevators, emergency generators, and general building infrastructure.

SAMPLE PROJECTS

HUD MAP 223(f)

- 6 Eleven Lamar *(Arlington, TX)*
- Cypress Lake *(Houston, TX)*
- Northchase Village *(Houston, TX)*

ASTM

- Overlook at Thornton *(Denver, CO)*
- Creekside Place *(Thornton, CO)*
- Village at Greenbriar *(Westminster, CO)*

ESA – Phase I

- Carstens Gardens *(Beatrice, NE)*

DANA M. PELKEY

Environmental Technician

d.pelkey@d3g.com / 804-955-5111

EDUCATION

College of Charleston – B.S. in Geology and Environmental Geosciences

CERTIFICATIONS/REGISTRATIONS/TRAINING

- Principles of Phase I Environmental Site Assessments - ASTM E 1527
- Principles of Vapor Encroachment Screenings – ASTM E 2600
- HUD Multi-Family Accelerated Processing (MAP) Training
- HUD Office of Residential Care Facilities (ORCF) Training
- HUD Web-based Instructional System for Environmental Reviews (WISER)
- OSHA/AHERA Asbestos Awareness Training
- HUD Lead-Based Paint Visual Assessment Training Course
- 24-Hour Asbestos Inspector Initial Training Course
- 24-Hour Lead-Based Paint Inspector Initial Training Course

SUMMARY OF EXPERIENCE

Dana Pelkey is an Environmental Technician for Dominion Due Diligence Group. As an Environmental Technician, Ms. Pelkey is directly responsible for coordinating, conducting and preparing Phase I Environmental Site Assessments (HUD, ASTM E 1527, state tax credits, Fannie Mae, Freddie Mac, etc.) throughout the United States. Ms. Pelkey is also directly responsible for coordinating, conducting, and preparing Environmental Reviews throughout the United States, consisting of compliance evaluations with the National Environmental Policy Act (NEPA) and other project-specific guidance requirements (MAP, LEAN, HOME, HTF, etc.). Additionally, Ms. Pelkey is responsible for performance and management of field projects, client contact and comprehensive report writing.

SAMPLE PROJECTS

HUD MAP 223(f)

- Redwood Pataskala (Carrington Ridge)
  (Pataskala, OH)
- Goldfinch Meadows II Apartments
  (Kearneysville, WV)
- Redwood Delaware (Preserve at Quail Pass) Phase III
  (Delaware, OH)
- Redwood Texas TWP
  (Kalamazoo, MI)
- MH Strategies – Barry Homes
  (Memphis TN)
- Hanover Townhomes
  (Caledonia, MI)
- Traditions of Holland
  (Holland, MI)
- Redwood DeWitt
  (Dewitt, MI)
- Wayne Lofts
  (Cincinnati, OH)

HUD MAP 221 (d)(4) NC

- Proposed Evoke Living at Morris Field *(Charlotte, NC)*
- Proposed Overlook at Riverside II
  (Falling Waters, WV)
- Proposed The Rose at Peet's Corner Apartments
  (Peets Corner, Al)

HUD MAP 221 (d)(4) SR

- Barry Homes
  (Memphis, TN)
- Traditions of Holland
  (Holland, MI)

ASTM

- Overlook Manor
  (Frederick, MD)

LEXI BRASS, EP

Housing Preservation Services - Environmental Team Manager
l.brass@d3g.com/ 571-375-5078

EDUCATION

University of Virginia — B.A. in Environmental Science

CERTIFICATIONS/REGISTRATIONS/TRAINING

- Principles of Phase I Environmental Site Assessments - ASTM E 1527
- Principles of Vapor Encroachment Screenings – ASTM E 2600
- HUD Multi-Family Accelerated Processing (MAP) Training
- HUD Office of Residential Care Facilities (ORCF) Training
- HUD Rental Assistance Demonstration (RAD) Training
- HUD Web-based Instructional System for Environmental Reviews (WISER)
- OSHA/AHERA Asbestos Awareness Training
- 24-Hour Asbestos Inspector Initial Training Course
- HUD Lead-Based Paint Visual Assessment Training Course
- 24-Hour Lead-Based Paint Inspector Initial Training Course

SUMMARY OF EXPERIENCE

Lexi Brass is a Housing Preservation Services Environmental Team Manager for Dominion Due Diligence Group. As Team Manager, Ms. Brass is responsible for assisting and supporting the Housing Preservation Services (HPS) team with the preparation of Phase I Environmental Site Assessments (HUD, ASTM E 1527, state tax credits, Fannie Mae, Freddie Mac, etc.) and Environmental Reviews throughout the United States, consisting of compliance evaluations with the National Environmental Policy Act (NEPA) and other project-specific guidance requirements (MAP, RAD, SAC, LEAN, HOME, HTF, etc.). Ms. Brass is also responsible for assisting the HPS team with performing regulatory file reviews, client requested report revisions, providing guidance and support to environmental staff, typical managerial duties, and achieving OTD and revenue goals.

SAMPLE PROJECTS

HUD RAD

- Burlington Housing Authority
  (Burlington, NC)
- Miles-Elmarge
  (Cleveland, OH)
- Okato Manor
  (Oconto, WI)

HUD SAC

- Arbors at Merrillwood I
  (Alachua, FL)
- Bonair Towers
  (Fort Myers, FL)
- Bronstein Apartments
  (Nashua, NH)

HUD CAPITAL FUND PROGRAM

- Drexel House Apartments
  (West Palm Beach, FL)
- Seminole Estates Apartments
  (Lantana, FL)

STATE HOUSING TAX CREDITS

- Randolph
  (VHDA – Richmond, VA)
- North Augusta Gardens
  (SCSHFDA – North Augusta, SC)
- Savannah Summit
  (GA DCA – Savannah, GA)
- Cedarhurt Homes
  (MHC – Natchez, MS)
- Grove Manor Apartments
  (FHFC – Winter Haven, FL)

HUD MAP 221(d)(4) SR

- Proposed Greer Mill
  (Greer, SC)
- Thornwood Commons
  (Columbus, OH

ROB HAZELTON, LEED AP

Chief Executive Officer

r.hazelton@d3g.com / 804-513-6354

EDUCATION

Bucknell University – Bachelor of Arts

PROFESSIONAL MEMBERSHIPS

- Eastern Lenders Association (ELA)
- Federal Home Loan Bank (FHLB) - Atlanta Affordable Housing Advisory Council
- Greater Richmond Association for Commercial Real Estate (GRACRE)
- Housing Advisory Group (HAG)
- Institute for Responsible Housing Preservation (IRHP)
- Midwest Lenders Association (MLA)
- Mortgage Bankers Association (MBA)
- Mortgage Lenders Association (MLA)
- National Association of Home Builders (NAHB)
- National Housing and Rehabilitation Association (NH&RA)
- National Leased Housing Association (NLHA *Board of Directors)
- Southeastern Mortgage Advisory Council (SMAC)
- US Green Building Council (USGBC)
- Various State Affordable Housing Organizations (CO, GA, TX, VA)
- Western Mortgagee Advisory Council (WMAC)

SUMMARY OF EXPERIENCE

Mr. Hazelton has accumulated more than 25 years of real estate due diligence inspection experience, focusing primarily on environmental issues, building code compliance, construction engineering, and cost estimation services. He founded Dominion Due Diligence Group (D3G) over two (2) decades ago with a focus on affordable housing solutions. Rob has worked in all 50 states for the preservation of multifamily and senior housing under the LIHTC Qualified Allocation Plans (QAP). He has been involved with the HUD Multifamily Accelerated Process (MAP) Guide since inception and is proficient in the FHA-HUD multifamily mortgage insurance markets. The last five (5) years he has worked closely with HUD to define and leverage energy efficiency in the subsidized housing portfolio. Rob frequently provides technical services for HUD's many pilot and demonstration programs, and is currently working with the LIHTC pilot, the Rental Assistance Demonstration (RAD), Moving to Work (MTW), self- managed Energy Performance Contracting (EPC), 24 CFR Part 50 HEROS, and the CNA e-Tool.

Mr. Hazelton has worked with over 250 public housing agencies encompassing greater than 100,000 units of conversion with the HUD Rental Assistance Demonstration (RAD) program; including the large housing authorities of New York City, San Francisco, El Paso, Baltimore, Nashville, Greensboro, Jacksonville, Charlotte, Milwaukee, Birmingham and Richmond. Rob is a common speaker at housing industry conferences throughout the nation, presenting both technical subject matter topics, as well as general housing policy.

ROB HAZELTON, LEED AP

Chief Executive Officer

r.hazelton@d3g.com / 804-513-6354

CERTIFICATIONS/REGISTRATIONS/TRAINING - RECEIVED

Mr. Hazelton has received extensive industry-related certifications, registrations and training in the past decade, including:

- USGBC Leadership in Energy and Environmental Design Accredited Professional (LEED AP)
- Member of the Association of Energy Engineers (AEE)
- EPA AAI Accredited "Environmental Professional" (EP)
- Practices of Building Design and Engineering
- HUD Multifamily Accelerated Processing (MAP) Due Diligence Training
- HUD A/E Review and Cost Estimation Training
- HUD Green Building and ARRA Green Retrofit Training
- ICC – HUD Fair Housing Act Accessibility Workshop

TRAINING - GIVEN

Mr. Hazelton has been asked to participate in numerous panel discussions at industry conferences, give training seminars for clients and interpret HUD MAP Guidebook regulations. The following are training events in which Mr. Hazelton has been asked to participate within the last five years:

- HUD MAP Lender Annual Conference (ELA, SWAC, SMAC, MWLC, WMAC)
- HUD Regional Office Technical Training (Detroit and Richmond HUD Offices)
- HUD Rental Assistance Demonstration Training
- MAP Lender Annual Training Events (Love Funding, Wells Fargo, Berkadia, Prudential, Walker & Dunlop)
- Affordable Housing Industry Events (Novogradac, CohnReznick, IRHP, NH&RA, NLHA)
- State Finance Housing Agencies/LIHTC (Alabama, Colorado, Kentucky, Mississippi, Ohio & Virginia)

Training topics have included the following:

- Rental Assistance Demonstration (RAD)
- Updates to the HUD Multifamily Accelerated Process (MAP)
- Section 202 Elderly Housing - Project Rental Assistance Contract (PRAC)
- HUD Section 221(d4) New Construction and Substantial Rehabilitation Processing
- HUD Energy, Green MIP, and Climate Resiliency
- Green Retrofit/Green/Integrated Property Condition Assessments
- Accessibility (FHA, UFAS and ADA Compliance)
- Construction Cost Containment and Innovative Practices in Construction

Appendix I:

Certificate of Liability Insurance

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 8/25/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Riggs, Counselman, Michaels & Downes, Inc.
4 North Park Drive, Suite 500
Hunt Valley MD 21030

CONTACT NAME: Marion Caldwell
PHONE (A/C, No, Ext): 804-237-5921 FAX (A/C, No): 804-237-5901
E-MAIL ADDRESS: mcaldwell@rcmd.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Cincinnati Casualty Company	28665
INSURER B : Cincinnati Indemnity Company	23280
INSURER C : Nautilus Insurance Company	17370
INSURER D : At-Bay Specialty Insurance Company	19607
INSURER E :	
INSURER F :	

INSURED DOMIENV-01
Dominion Environmental Group, Inc dba Dominion Due Diligence Group
201 Wylderose Drive
Midlothian VA 23113-6845

COVERAGES **CERTIFICATE NUMBER:** 438709612 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
C	X **COMMERCIAL GENERAL LIABILITY**			ECP204455011	9/1/2025	9/1/2026	EACH OCCURRENCE	$ 5,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 100,000
							MED EXP (Any one person)	$ 5,000
	X Proj Agg: $2M						PERSONAL & ADV INJURY	$ 5,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 5,000,000
	X POLICY X PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$ 5,000,000
	OTHER:						Retention - Per Occ	$ $10,000
A	**AUTOMOBILE LIABILITY**			EBA0627123	9/1/2025	9/1/2026	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	X HIRED AUTOS ONLY / X NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
A	**UMBRELLA LIAB** X OCCUR			ENP0627123	9/1/2025	9/1/2026	EACH OCCURRENCE	$ 3,000,000
	X **EXCESS LIAB** CLAIMS-MADE						AGGREGATE	$ 3,000,000
	DED RETENTION $							$
B	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** Y / N	N / A		EWC 0627125	9/1/2025	9/1/2026	X PER STATUTE OTH-ER	
	ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? **(Mandatory in NH)**						E.L. EACH ACCIDENT	$ 1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000
D	Cyber Risk (Claims-Made)			AB671246903	9/1/2025	9/1/2026	Each Claim/Agg	$1M/$1M
C	Prof Liab (Claims Made)			ECP204455011	9/1/2025	9/1/2026	Each Claim/Agg	$5M/$5M
C	Contractors Poll (Occ)			ECP204455011	9/1/2025	9/1/2026	Each Claim/agg	$5M/$5M

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Professional Liab Retroactive Date: 09-01-1994 / Professional Liability - Each Claim Retention: $25,000; Contractor's Pollution Liab Retention: $25,000

Professional Liability Retroactive Date: 09-01-1994
Professional Liability Deductible: $25,000 Each Claim

CERTIFICATE HOLDER

Dominion Environmental Group
dba Dominion Due Diligence Group
201 Wylderose Drive
Midlothian VA 23113

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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Appendix J:

Asbestos Inspection Report

Environmental Concerns, Inc.

Project Number # 20630

Asbestos Inspection

St. Theresa Village
6783 Siebern Avenue
Silverton, Ohio

Environmental Concerns, Inc.

Scope of Work

Environmental Concerns, Inc. provided an Asbestos NESHAP Renovation Inspection at St. Therasa Village located at 6783 Siebern in Silverton, Ohio.

Environmental Concerns conducted a NESHAP Renovation Inspection to locate asbestos containing materials that would be impacted during the renovation. Interior and exterior building materials are included in the inspection. Potential asbestos-containing building materials were thoroughly inspected, sampled, and quantified by an Indiana licensed Asbestos Evaluation Specialist. The inspection was conducted on September 22, 2025. Pete Gibson, an Ohio licensed Asbestos Evaluation Specialist conducted the inspection.

The quantities contained within this report are estimates. If Abatement Contractor's use this report for bid preparation, they should conduct site inspections and determine their own quantities for calculation of their bids.

Sample Selection Procedure

Our asbestos survey was semi-destructive in nature, and where feasible, bulk material samples were collected from "suspect" building materials. These samples consist of a small quantity of various materials which are considered suspect asbestos materials.

Asbestos-containing materials cannot be disturbed, moved, or broken, unless using special precautions and performed by a licensed Asbestos Abatement Contractor. However, additional sampling should be completed in any areas of the building where renovation or repair work will damage or disturb materials not previously shown to be free of asbestos. Each sample was collected in a controlled manner and placed in an airtight container with appropriate documentation. Samples were then delivered to a National Voluntary Laboratory Accreditation Program (NVLAP) accredited environmental testing laboratory. Samples were analyzed via Polarized Light Microscopy (PLM) with confirmation analysis of at least one NOB material that was not identified as an ACM via PLM analysis via Transmission Electron Microscopy (TEM) in accordance with ASTM E 2356-18. Samples are identified in the report by a numeric or an alphanumeric labeling system on the Chain of Custody. Results of the analysis are included as a part of this report.

Summary

Sampled materials included drywall/drywall compound, ceiling texture, floor tiles, and adhesives. An asbestos-containing material is defined as containing greater than 1% asbestos. The following table lists the materials sampled and their respective asbestos content:

SAMPLE NUMBER	SAMPLED MATERIAL	LOCATION	% ASBESTOS
CA-1	2'x2' Lay In Ceiling Tile	1st Fl Hall	None Detected
CA-2	2'x2' Lay In Ceiling Tile	2nd Fl Hall	None Detected
CA-3	2'x2' Lay In Ceiling Tile	3rd Fl Hall	None Detected
CA-4	Drywall	3rd Fl Hall	None Detected
CA-5	Joint Compound	3rd Fl Hall	None Detected
CA-6	Drywall	1st Fl Hall	None Detected
CA-7	Joint Compound	1st Fl Hall	None Detected

Environmental Concerns, Inc.

SAMPLE NUMBER	SAMPLED MATERIAL	LOCATION	% ASBESTOS
116-8	Beige/Tan Linoleum	Unit 116	None Detected*
116-9	Ceiling Texture	Unit 116	None Detected
116-10	Caulk @ Countertop	Unit 116	None Detected*
116-11	Joint Compound	Unit 116	None Detected
116-12	Sink Undercoating - White	Unit 116	None Detected*
102-13	Ceiling Texture	Unit 102	None Detected
102-14	Caulk @ Countertop	Unit 102	None Detected
102-15	Sink Undercoating	Unit 102	None Detected
102-16	Beige/Tan Linoleum	Unit 102	None Detected
107-17	Sink Undercoating – White	Unit 107	None Detected*
107-18	Ceiling Texture	Unit 107	None Detected
107-19	Covebase - White	Unit 107	None Detected*
105-20	Ceiling Texture	Unit 105	None Detected
215-21	Sink Undercoating – White	Unit 215	None Detected
215-22	Ceiling Texture	Unit 215	None Detected
215-23	Brown Linoleum	Unit Kit	None Detected*
215-24	Caulk @ Countertop	Unit 215	None Detected
215-25 (Layer 1)	Cove Base - White	Unit 215	None Detected
215-25 (Layer 2)	Mastic - Yellow	Unit 215	None Detected
214-26	Beige/Tan Linoleum	Unit 214	None Detected
214-27	Ceiling Texture	Unit 214	None Detected
214-28	Caulk @ Countertop	Unit 214	None Detected
210-29	Ceiling Texture	Unit 210	None Detected
CA-30	12" Beige Floor Tile	1st Fl Custodial Cl	None Detected*
CA-31	12" Beige Floor Tile	1st Fl Custodial Cl	None Detected
CA-32	12" Beige Floor Tile	1st Fl Custodial Cl	None Detected
Ext-33	Door Caulk	N Side Entry	None Detected*
Ext-34	Door Caulk	N Side Entry	None Detected
Ext-35	Door Caulk	S Side Entry	None Detected
Ext-36	Window Caulk	Front Entry	None Detected*
Ext-37	Window Caulk	Front Right	None Detected
Ext-38	Window Caulk	Rear Right	None Detected
Ext-39	Rubber Roof	Flat Roof	None Detected*
Ext-40	Rubber Roof	Flat Roof	None Detected
Ext-41	Rubber Roof	Flat Roof	None Detected
Ext-42 (Layer 1)	Shingle - Black	Slope Roof	None Detected*
Ext-42 (Layer 2)	Felt - Black	Slope Roof	None Detected*
Ext-43 (Layer 1)	Shingle - Black	Slope Roof	None Detected
Ext-43 (Layer 2)	Felt - Black	Slope Roof	None Detected
Ext-44 (Layer 1)	Shingle - Black	Slope Roof	None Detected
Ext-44 (Layer 2)	Felt - Black	Slope Roof	None Detected
CA-45	Joint Compound	Maint Off	None Detected
CA-46	Drywall	Maint Off	None Detected
215-47	Brown Linoleum	Unit 215	None Detected
215-48	Brown Linoleum	Unit 215	None Detected
215-49	Covebase – White	Unit 215	None Detected

* = NOB material re-analyzed via TEM

Summary of Asbestos Containing Materials

There were no asbestos containing materials identified during the inspection. If other materials are encountered during construction that were not sampled, the materials should be assumed asbestos containing until sampled and proven otherwise.

Environmental Concerns, Inc.

Laboratory Analysis

All samples collected with locations and results are listed within this report. Sample analysis was provided by AmeriSci in Midlothian, Virginia. Analysis sheets are included in the appropriate appendix.

Recommendations

These recommendations were developed after reviewing analysis of samples collected during the inspection as well as considering local, state, and federal regulations associated with asbestos.

The following materials were identified as asbestos containing materials greater than one percent:

NONE

The above materials should be removed by an Ohio licensed Asbestos Abatement Company prior to any construction activities at the site that will disturb the material.

Prepared by,

Pete Gibson
Asbestos Evaluation Specialist

Environmental Concerns, Inc.

SAMPLE ANALYSIS

1448 Gardiner Lane, #402 Louisville, Kentucky 40213 502/458-4488

AmeriSci Richmond
13635 GENITO ROAD
MIDLOTHIAN, VIRGINIA 23112
TEL: (804) 763-1200 • FAX: (804) 763-0493

October 10, 2025

Dominion Due Diligence Group
Attn: Kim Dingledine
201 Wylderose Drive
Midlothian, VA 23113

RE: Dominion Due Diligence Group
Job Number 125092375
P.O. #2025-1881
2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

Dear Kim Dingledine:

Enclosed are the results for PLM asbestos analysis of the following Dominion Due Diligence Group samples received at AmeriSci on Monday, September 29, 2025, for a 3 day turnaround:

CA-1, CA-2, CA-3, CA-4, CA-5, CA-6, CA-7, 116-8, 116-9, 116-10, 116-11, 116-12, 102-13, 102-14, 102-15, 102-16, 107-17, 107-18, 107-19, 105-20, 215-21, 215-22, 215-23, 215-24, 215-25, 214-26, 214-27, 214-28, 210-29, CA-30, CA-31, CA-32, Ext-33, Ext-34, Ext-35, Ext-36, Ext-37, Ext-38, Ext-39, Ext-40, Ext-41, Ext-42, Ext-43, Ext-44, CA-45, CA-46, 215-47, 215-48, 215-49

The 49 samples contained in zip lock bag were shipped to AmeriSci via Fed Ex. These samples were prepared and analyzed according to EPA PLM Method (EPA 600/R-93/116 Section 2.2). The required analytical information, analysis results, analyst signature and laboratory identification are contained in the PLM Bulk Asbestos Report. If TEM analysis was requested for selected samples the gravimetric reduction data (by Sec 2.3) and TEM Asbestos % (by Sec 2.5) are included in Table 1 along with a summary of Asbestos % by PLM for all samples analyzed.

This report relates ONLY to the sample analysis expressed as % asbestos. AmeriSci assumes no responsibility for customer supplied data such as "sample type", "location", or "area sampled". This report must not be used to claim product endorsement by AmeriSci, NVLAP or any agency of the U. S. Government. The National Institute of Standards and Technology accreditation requirements mandate that this report must not be reproduced, except in full, without the written approval of the laboratory. This report may contain specific data not covered by NVLAP or ELAP accreditations, if so identified in relevant footnotes.

AmeriSci appreciates this opportunity to serve your organization. Please contact us for any further assistance or with any questions.

Sincerely,

Beverly A. Schrage

Senior Analyst | Authorized Signatory

AmeriSci Richmond
13635 GENITO ROAD
MIDLOTHIAN, VIRGINIA 23112
TEL: (804) 763-1200 • FAX: (804) 763-0493

PLM Bulk Asbestos Report

Dominion Due Diligence Group
Attn: Kim Dingledine
201 Wylderose Drive

Midlothian, VA 23113

Date Received 9/29/2025
Date Examined 10/03/25

AmeriSci Job # 125092375
P.O. #
Page 1 **of** 9

RE: 2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos	Notes
CA-1	125092375-01	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: 2'x2' Lay In Ceiling Tile; 1st Fl Hall **Analyst Description:** White, Homogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 65%, Fibrous glass 15%, Non-fibrous 20%				
CA-2	125092375-02	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: 2'x2' Lay In Ceiling Tile; 2nd Fl Hall **Analyst Description:** White, Homogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 65%, Fibrous glass 15%, Non-fibrous 20%				
CA-3	125092375-03	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: 2'x2' Lay In Ceiling Tile; 3rd Fl Hall **Analyst Description:** White, Homogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 65%, Fibrous glass 15%, Non-fibrous 20%				
CA-4	125092375-04	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Drywall; 3rd Fl Hall **Analyst Description:** Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
CA-5	125092375-05	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Compound; 3rd Fl Hall **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
CA-6	125092375-06	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Drywall; 1st Fl Hall **Analyst Description:** Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				

See Reporting notes on last page

PLM Bulk Asbestos Report

2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos	Notes
CA-7	125092375-07	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Compound; 1st Fl Hall **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
116-8	125092375-08	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Beige/Tan Linoleum; Unit 116 **Analyst Description:** Beige/Tan, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
116-9	125092375-09	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Ceiling Texture; Unit 116 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
116-10	125092375-10	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Caulk @ Countertop; Unit 116 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
116-11	125092375-11	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Compound; Unit 116 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
116-12	125092375-12	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Sink Undercoating; Unit 116 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 15%, Non-fibrous 85%				
102-13	125092375-13	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Ceiling Texture; Unit 102 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				

See Reporting notes on last page

PLM Bulk Asbestos Report

2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos	Notes
102-14	125092375-14	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Caulk @ Countertop; **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
102-15	125092375-15	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Sink Undercoating; **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 15%, Non-fibrous 85%				
102-16	125092375-16	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Beige/Tan Linoleum; **Analyst Description:** Beige/Tan, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
107-17	125092375-17	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Sink Undercoating; Unit 107 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 15%, Non-fibrous 85%				
107-18	125092375-18	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Ceiling Texture; **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
107-19	125092375-19	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Covebase; **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
105-20	125092375-20	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Ceiling Texture; Unit 105 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				

See Reporting notes on last page

PLM Bulk Asbestos Report

2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos	Notes
215-21	125092375-21	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Sink Undercoating; Unit 215 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 15%, Non-fibrous 85%				
215-22	125092375-22	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Ceiling Texture; Unit 215 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
215-23	125092375-23	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Brown Linoleum; Unit Kit **Analyst Description:** Brown, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
215-24	125092375-24	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Caulk @ Countertop; Unit 215 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
215-25	125092375-25L1	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Covebase; Unit 215 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Cove Base **Asbestos Types:** **Other Material:** Non-fibrous 100%				
215-25	125092375-25L2	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Covebase; Unit 215 **Analyst Description:** Yellow, Heterogeneous, Non-Fibrous, Mastic **Asbestos Types:** **Other Material:** Non-fibrous 100%				
214-26	125092375-26	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Beige/Tan Linoleum; Unit 214 **Analyst Description:** Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 65%, Non-fibrous 35%				

See Reporting notes on last page

PLM Bulk Asbestos Report

2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos	Notes
214-27	125092375-27	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Ceiling Texture; Unit 214 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
214-28	125092375-28	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Caulk @ Countertop; Unit 214 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
210-29	125092375-29	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Ceiling Texture; Unit 210 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
CA-30	125092375-30	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: 12" Beige Floor Tile/Mastic; 1st Fl Custodial Cl **Analyst Description:** Beige, Heterogeneous, Non-Fibrous, Floor Tile **Asbestos Types:** **Other Material:** Non-fibrous 100% **Comment:** Insufficient Mastic				
CA-31	125092375-31	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: 12" Beige Floor Tile/Mastic; 1st Fl Custodial Cl **Analyst Description:** Beige, Homogeneous, Non-Fibrous, Floor Tile **Asbestos Types:** **Other Material:** Non-fibrous 100% **Comment:** Insufficient Mastic				
CA-32	125092375-32	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: 12" Beige Floor Tile/Mastic; 1st Fl Custodial Cl **Analyst Description:** Beige, Homogeneous, Non-Fibrous, Floor Tile **Asbestos Types:** **Other Material:** Non-fibrous 100% **Comment:** Insufficient Mastic				

See Reporting notes on last page

PLM Bulk Asbestos Report

2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos	Notes
Ext-33	125092375-33	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Door Caulk; N Side Entry **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
Ext-34	125092375-34	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Door Caulk; N Side Entry **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
Ext-35	125092375-35	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Door Caulk; S Side Entry **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
Ext-36	125092375-36	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Window Caulk; Front Entry **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
Ext-37	125092375-37	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Window Caulk; Front Right **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
Ext-38	125092375-38	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Window Caulk; Rear Right **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
Ext-39	125092375-39	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Rubber Roof; Flat Roof **Analyst Description:** Black, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				

See Reporting notes on last page

PLM Bulk Asbestos Report

2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos	Notes
Ext-40	125092375-40	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Rubber Roof; Flat Roof **Analyst Description:** Black, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
Ext-41	125092375-41	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Rubber Roof; Flat Roof **Analyst Description:** Black, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
Ext-42	125092375-42L1	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Shingle/Felt; Slope Roof **Analyst Description:** Black, Homogeneous, Fibrous, Shingle **Asbestos Types:** **Other Material:** Fibrous glass 5.0%, Non-fibrous 95%				
Ext-42	125092375-42L2	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Shingle/Felt; Slope Roof **Analyst Description:** Black, Heterogeneous, Fibrous, Felt **Asbestos Types:** **Other Material:** Cellulose 65%, Non-fibrous 35%				
Ext-43	125092375-43L1	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Shingle/Felt; Slope Roof **Analyst Description:** Black, Heterogeneous, Fibrous, Shingle **Asbestos Types:** **Other Material:** Fibrous glass 5.0%, Non-fibrous 95%				
Ext-43	125092375-43L2	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Shingle/Felt; Slope Roof **Analyst Description:** Black, Heterogeneous, Fibrous, Felt **Asbestos Types:** **Other Material:** Cellulose 65%, Non-fibrous 35%				
Ext-44	125092375-44L1	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Shingle/Felt; Slope Roof **Analyst Description:** Black, Heterogeneous, Fibrous, Shingle **Asbestos Types:** **Other Material:** Fibrous glass 5.0%, Non-fibrous 95%				

See Reporting notes on last page

PLM Bulk Asbestos Report

2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos	Notes
Ext-44	125092375-44L2	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Shingle/Felt; Slope Roof **Analyst Description:** Black, Heterogeneous, Fibrous, Felt **Asbestos Types:** **Other Material:** Cellulose 65%, Non-fibrous 35%				
CA-45	125092375-45	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Compound; Maint Off **Analyst Description:** White, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
CA-46	125092375-46	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Drywall; Maint Off **Analyst Description:** Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
215-47	125092375-47	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Brown Linoleum; Unit 215 **Analyst Description:** Brown, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
215-48	125092375-48	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Brown Linoleum; Unit 215 **Analyst Description:** Brown, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%				
215-49	125092375-49	***No***	NAD (by CVES) by Tou Si Anothay on 10/03/25	
Location: Covebase; Unit 215 **Analyst Description:** White, Heterogeneous, Non-Fibrous, Cove Base **Asbestos Types:** **Other Material:** Non-fibrous 100%				

See Reporting notes on last page

125092375

ASBESTOS-CONTAINING MATERIALS SURVEY

SITE: St. Theresa Village
ADDRESS: 6783 Siebern Avenue – Silverton, Ohio
DATE: 9-22-25
CLIENT:

☐ PLEASE ALLOW FOR POSITIVE STOP METHODOLOGY

PERSONNEL: P. Gibson
PROJECT #: 2025-1881
LABORATORY: AmeriSci
TAT: 3-day
TYPE OF ANALYSIS: PLM

HOMOGENOUS AREA	SAMPLE #	MATERIAL DESCRIPTION	LOCATION	QUANTITY/ FRIABILITY
1	GA-1	2'x2' lay-in ceiling tile	1st Fl Hall	
1	2	| |	2nd Fl Hall	
1	3		3rd Fl Hall	
2	4	Drywall	|	
3	5	Compound		
2	6	Drywall	1st Fl Hall	
3	7	compound	|	
4 *	116-8	beige/tan linoleum	Unit 116	
5	9	ceiling texture	|	
4 *	10	caulk @ countertop	|	
3	11	Compound	|	
7 *	12	sink undercoating	|	
5	102-13	ceiling texture	Unit 102	
6	14	caulk @ countertop		
7	15	sink undercoating		
4	16	beige/tan linoleum		
7 *	107-17	sink undercoating	Unit 107	
5	18	ceiling texture		
8 *	19	cove base		
5	105-20	ceiling texture	Unit 105	
7	215-21	sink undercoating	Unit 215	
5	22	ceiling texture	|	
9 *	23	Brown linoleum	| Kit	

SUBMITTED BY: Pat Gibson DATE SUBMITTED: 9/24/25 SIGNATURE: Pat Gibson

RECEIVED BY: DATE RECEIVED: SIGNATURE:

DOMINION DUE DILIGENCE GROUP

201 Wylderose Drive ♦ MIDLOTHIAN ♦ VIRGINIA 23113 ♦ PHONE: (804) 358-2020 ♦ FAX: (804) 897-6404

Received

SEP 29 2025

ALC

125092875

ASBESTOS-CONTAINING MATERIALS SURVEY

SITE: St. Theresa Village
ADDRESS: 6783 Siebern Avenue – Silverton, Ohio
DATE: 9-22-25
CLIENT:

☐ PLEASE ALLOW FOR POSITIVE STOP METHODOLOGY

PERSONNEL: P. Gibson
PROJECT #: 2025-1881
LABORATORY: AmeriSci
TAT: 3-day
TYPE OF ANALYSIS: PLM

HOMOGENOUS AREA	SAMPLE #	MATERIAL DESCRIPTION	LOCATION	QUANTITY/ FRIABILITY
6	215-24	Caulk @ countertop	Unit 215	
8	1-25	cove base		
4	214-26	beige/tan linoleum	Unit 214	
5	27	ceiling texture		
6	28	caulk @ countertop		
5	210-29	ceiling texture	Unit 210	
9 *	CA-30	12" beige floor tile/mastic	1st Fl custodial cl.	105F
9	31			
9	32			
10 *	Ext-33	Door caulk	N Side entry	
10	34			
10	35		S Side entry	
11 *	36	Window caulk	Front entry	
11	37		Front right	
11	38		Rear Right	
12	39	Rubber Roof	Flat Roof	
12	40			
12	41			
13 *	42	Shingle/felt	Slope Roof	
13	43			
13	44			
#3	CA-45	Compound	Mixed Off.	
#2	46	Drywall		

SUBMITTED BY: Peter Gibson DATE SUBMITTED: 9/24/25 SIGNATURE: [signature]

RECEIVED BY: DATE RECEIVED: SIGNATURE:

DOMINION DUE DILIGENCE GROUP

201 Wylderose Drive ♦ MIDLOTHIAN ♦ VIRGINIA 23113 ♦ PHONE: (804) 358-2020 ♦ FAX: (804) 897-6404

Received
SEP 29 2025
AK

125092375

ASBESTOS-CONTAINING MATERIALS SURVEY

SITE: St. Theresa Village
ADDRESS: 6783 Siebern Avenue – Silverton, Ohio
DATE: 9/22/25
CLIENT:

☐ **PLEASE ALLOW FOR POSITIVE STOP METHODOLOGY**

PERSONNEL: P. Gibson
PROJECT #: 2025-1881
LABORATORY: AmeriSci
TAT: 3-day
TYPE OF ANALYSIS: PLM

HOMOGENOUS AREA	SAMPLE #	MATERIAL DESCRIPTION	LOCATION	QUANTITY/ FRIABILITY
9	215-47	Brown linoleum	Unit 215	
9	48			
8	49	Cove base		

SUBMITTED BY: P. Gibson **DATE SUBMITTED:** 9/24/25 **SIGNATURE:** [signature]

RECEIVED BY: _____ **DATE RECEIVED:** _____ **SIGNATURE:** _____

DOMINION DUE DILIGENCE GROUP

201 Wylderose Drive ♦ MIDLOTHIAN ♦ VIRGINIA 23113 ♦ PHONE: (804) 358-2020 ♦ FAX: (804) 897-6404

Received
SEP 29 2025
ALC

Environmental Concerns, Inc.

POINT COUNT/TEM ANALYSIS

1448 Gardiner Lane, #402 Louisville, Kentucky 40213 502/458-4488

AmeriSci Job #: **125092375**

Client Name: Dominion Due Diligence Group

Table I
Summary of Bulk Asbestos Analysis Results

2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
01	CA-1		—	—	—	—	NAD	NA
Location: 2'x2' Lay In Ceiling Tile; 1st Fl Hall								
02	CA-2		—	—	—	—	NAD	NA
Location: 2'x2' Lay In Ceiling Tile; 2nd Fl Hall								
03	CA-3		—	—	—	—	NAD	NA
Location: 2'x2' Lay In Ceiling Tile; 3rd Fl Hall								
04	CA-4		—	—	—	—	NAD	NA
Location: Drywall; 3rd Fl Hall								
05	CA-5		—	—	—	—	NAD	NA
Location: Compound; 3rd Fl Hall								
06	CA-6		—	—	—	—	NAD	NA
Location: Drywall; 1st Fl Hall								
07	CA-7		—	—	—	—	NAD	NA
Location: Compound; 1st Fl Hall								
08	116-8		0.275	63.4	32.9	3.6	NAD	NAD
Location: Beige/Tan Linoleum; Unit 116								
09	116-9		—	—	—	—	NAD	NA
Location: Ceiling Texture; Unit 116								
10	116-10		0.268	45.1	45.6	9.3	NAD	NAD
Location: Caulk @ Countertop; Unit 116								
11	116-11		—	—	—	—	NAD	NA
Location: Compound; Unit 116								
12	116-12		0.136	19.1	44.2	36.7	NAD	NAD
Location: Sink Undercoating; Unit 116								
13	102-13		—	—	—	—	NAD	NA
Location: Ceiling Texture; Unit 102								
14	102-14		—	—	—	—	NAD	NA
Location: Caulk @ Countertop;								
15	102-15		—	—	—	—	NAD	NA
Location: Sink Undercoating;								
16	102-16		—	—	—	—	NAD	NA
Location: Beige/Tan Linoleum;								

See Reporting notes on last page

AmeriSci Job #: **125092375**

Client Name: Dominion Due Diligence Group

Table I
Summary of Bulk Asbestos Analysis Results

2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
17	107-17		0.057	21.3	44.1	34.6	NAD	NAD
Location: Sink Undercoating; Unit 107								
18	107-18		—	—	—	—	NAD	NA
Location: Ceiling Texture;								
19	107-19		0.318	33.1	65.9	1.0	NAD	NAD
Location: Covebase;								
20	105-20		—	—	—	—	NAD	NA
Location: Ceiling Texture; Unit 105								
21	215-21		—	—	—	—	NAD	NA
Location: Sink Undercoating; Unit 215								
22	215-22		—	—	—	—	NAD	NA
Location: Ceiling Texture; Unit 215								
23	215-23		0.358	62.9	33.3	3.8	NAD	NAD
Location: Brown Linoleum; Unit Kit								
24	215-24		—	—	—	—	NAD	NA
Location: Caulk @ Countertop; Unit 215								
25L1	215-25		—	—	—	—	NAD	NA
Location: Covebase; Unit 215; Cove Base								
25L2	215-25		—	—	—	—	NAD	NA
Location: Covebase; Unit 215; Mastic								
26	214-26		—	—	—	—	NAD	NA
Location: Beige/Tan Linoleum; Unit 214								
27	214-27		—	—	—	—	NAD	NA
Location: Ceiling Texture; Unit 214								
28	214-28		—	—	—	—	NAD	NA
Location: Caulk @ Countertop; Unit 214								
29	210-29		—	—	—	—	NAD	NA
Location: Ceiling Texture; Unit 210								
30	CA-30		0.285	12.0	77.3	10.7	NAD	NAD
Location: 12" Beige Floor Tile/Mastic; 1st Fl Custodial Cl; Floor Tile								
31	CA-31		—	—	—	—	NAD	NA
Location: 12" Beige Floor Tile/Mastic; 1st Fl Custodial Cl; Floor Tile								

See Reporting notes on last page

AmeriSci Job #: **125092375**

Client Name: Dominion Due Diligence Group

Table I
Summary of Bulk Asbestos Analysis Results

2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
32	CA-32		—	—	—	—	NAD	NA
Location: 12" Beige Floor Tile/Mastic; 1st Fl Custodial Cl; Floor Tile								
33	Ext-33		0.246	36.4	62.0	1.6	NAD	NAD
Location: Door Caulk; N Side Entry								
34	Ext-34		—	—	—	—	NAD	NA
Location: Door Caulk; N Side Entry								
35	Ext-35		—	—	—	—	NAD	NA
Location: Door Caulk; S Side Entry								
36	Ext-36		0.236	26.2	60.4	13.4	NAD	NAD
Location: Window Caulk; Front Entry								
37	Ext-37		—	—	—	—	NAD	NA
Location: Window Caulk; Front Right								
38	Ext-38		—	—	—	—	NAD	NA
Location: Window Caulk; Rear Right								
39	Ext-39		0.317	56.5	8.2	35.3	NAD	NAD
Location: Rubber Roof; Flat Roof								
40	Ext-40		—	—	—	—	NAD	NA
Location: Rubber Roof; Flat Roof								
41	Ext-41		—	—	—	—	NAD	NA
Location: Rubber Roof; Flat Roof								
42L1	Ext-42		0.305	22.4	52.7	25.0	NAD	NAD
Location: Shingle/Felt; Slope Roof ; Shingle								
42L2	Ext-42		0.370	53.4	34.6	12.0	NAD	NAD
Location: Shingle/Felt; Slope Roof ; Felt								
43L1	Ext-43		—	—	—	—	NAD	NA
Location: Shingle/Felt; Slope Roof ; Shingle								
43L2	Ext-43		—	—	—	—	NAD	NA
Location: Shingle/Felt; Slope Roof ; Felt								
44L1	Ext-44		—	—	—	—	NAD	NA
Location: Shingle/Felt; Slope Roof ; Shingle								
44L2	Ext-44		—	—	—	—	NAD	NA
Location: Shingle/Felt; Slope Roof ; Felt								

See Reporting notes on last page

AmeriSci Job #: **125092375**

Client Name: Dominion Due Diligence Group

Table I
Summary of Bulk Asbestos Analysis Results

2025-1881; St Therasa Village; 6783 Siebern Avenue - Silverton, Ohio (Report Amended 10/10/2025)

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
45	CA-45		—	—	—	—	NAD	NA
Location: Compound; Maint Off								
46	CA-46		—	—	—	—	NAD	NA
Location: Drywall; Maint Off								
47	215-47		—	—	—	—	NAD	NA
Location: Brown Linoleum; Unit 215								
48	215-48		—	—	—	—	NAD	NA
Location: Brown Linoleum; Unit 215								
49	215-49		—	—	—	—	NAD	NA
Location: Covebase; Unit 215; Cove Base								

Analyzed by: Beverly A. Schrage Reviewed by: Beverly A. Schrage

Date: 10/10/2025

Semi-Quantitative Analysis: NAD = no asbestos detected; NA = not analyzed; NA/PS = not analyzed due to positive stop; Trace = <1%; PLM analysis by EPA 600/R-93/116 per 40 CFR 763 (NVLAP Lab Code 101904-0) or NY ELAP 198.1 for New York friable samples which includes quantitation of any vermiculite observed (198.6 for NOB samples) or EPA 400 pt ct by EPA 600/M4-82-020 (NY ELAP Lab # 10984); TEM prep by EPA 600/R-93/116 Section 2.3 (analysis by Section 2.5, not covered by NVLAP Bulk accreditation); or NY ELAP 198.4 for New York NOB samples (NY ELAP Lab # 10984). Analysis using Jeol, Model JEM-100CX II microscope, Serial #156147-247. ** Warning Notes: Consider PLM fiber diameter limitation, only TEM will resolve fibers <0.25 micrometers in diameter. TEM bulk analysis is representative of the fine grained matrix material and may not be representative of non-uniformly dispersed debris, soils or other heterogeneous materials for which a combination PLM/TEM evaluation is recommended; Quantitation for beginning weights of <0.1 grams should be considered as qualitative only.

Environmental Concerns, Inc.

INSPECTOR LICENSE

1448 Gardiner Lane, #402 Louisville, Kentucky 40213 502/458-4488

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

2/18/2025

Pete Gibson
Environmental Concerns
PO Box 19848
Louisville, KY 40259

RE: Evaluation Specialist
Certification Number: ES35718
Expiration Date: 2/24/2026

Dear Pete Gibson:

This letter and enclosed certification card approves your request to be certified as an asbestos Evaluation Specialist. You must present your card upon request at any project site while performing duties. Copies of cards are not acceptable as proof of certification.

This certification may be revoked by the Director of the Ohio Environmental Protection Agency (EPA) for violation of any of the requirements of 3745-22 or 3745-20 of the Ohio Administrative Code.

If you have any questions, please contact the Asbestos Program at 614-644-0226 or by email at asbestoslicensing@epa.ohio.gov.

Sincerely,

Brandon M. Schwendeman

Brandon Schwendeman
Manager, Business Operations Support Section
Ohio EPA - Division of Air Pollution Control

State of Ohio
Environmental Protection Agency
Asbestos Program
Asbestos Hazard Evaluation Specialist
Pete
Gibson
Environmental Concerns
PO Box 19848
Louisville KY 40259
DOB: 12/26/62
Certification Number
ES35718
Expiration Date
2/24/26

700 • P.O. Box 1049 • Columbus, OH 43216-1049
(614) 644-3020 • (614) 644-3184 (fax)

Appendix K:

Radon Gas Inspection Report

Radon Measurement Assessment Report

Prepared for:
Dominion Due Diligence Group
201 Wylderose Drive
Midlothian, VA 23113

Project location:
St. Theresa Village
6783 Siebern Avenue
Silverton, OH 45236

PE Project Number:
OH25-843

Prepared by:
Protect Environmental
9822 Bluegrass Parkway
Louisville, KY 40299
Phone: 502-286-1250
ProtectEnvironmental.com

Report Date:
October 2, 2025

Prepared by:

Katherine Hall-Wurst
Protect Environmental

Preparation Date: October 2, 2025

This assessment report was developed specifically for the radon measurement conducted at St. Theresa Village, 6783 Siebern Avenue, Silverton, OH 45236. The measurement was conducted in accordance with the document *Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial and Mixed-Use Buildings (ANSI/AARST MA-MFLB-2023)* by Shad Evans, a radon measurement professional credentialed by the National Radon Proficiency Program (NRPP) and licensed by the state of Ohio.

Please direct inquiries regarding this report to Kenny Deemer at (724) 289-3155 or Kenny.Deemer@ProtectEnv.com.

Katherine Hall-Wurst
Radon Professional
NRPP Certification Number: 114751-RMP

Contents

Section 1.0: Introduction and Summary
Section 2.0: Scope of Work
Section 3.0: Measurement Protocol and Quality Assurance
Section 4.0: Measurement Devices
Section 5.0: Measurement Conditions
Section 6.0: Findings, Recommendations and Required Advisories

Appendices

Appendix A: Analytical Laboratory Report
Appendix B: Device Placement Log
Appendix C: Quality Assurance Documentation
Appendix D: Measurement Event Weather Conditions
Appendix E: Professional Certification Documentation
Appendix F: EPA Radon Zone Map
Appendix G: Notification Documentation

Section 1.0 – Introduction and Summary

1.1 Purpose

Radon is a colorless, odorless, radioactive gas formed through the decay of uranium. Trace amounts of uranium is present in all soil, and radon is found all over the planet. Most of this gas remains underground, but a small percentage migrates to the surface. Most radon is diluted in the atmosphere to very low concentrations but can build up to high concentrations in buildings. The amount of radon intruding into a building depends on the strength of the source, preferential pathways into the building, and a driving force (usually the thermal stack effect of the building). While two buildings may be identical, each site is unique. The only way to know what the radon levels are inside a building is through measurement. Two structures side-by-side can have totally different radon levels.

Radon is the second leading cause of lung cancer in the general population and the leading cause of lung cancer among non-smokers. Radon exposure is the cause of approximately 21,000 U.S. lung cancer deaths each year. This risk is largely preventable through testing and mitigation.

For more information on radon, please contact:

- The Ohio Department of Health, Radon Education and Licensing Program at **614-728-0272** or **indoor.radon@odh.ohio.gov** or visit their website at **https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/radon-education-and-licensing-program/welcome-to**
- The US Environmental Protection Agency at **1-800-767-7236** or visit their website at **https://www.epa.gov/radon**.

1.2 Property Information

Protect Environmental was engaged to conduct a radon measurement and assessment at the subject property located at St. Theresa Village, 6783 Siebern Avenue, Silverton, OH 45236. Prior to the measurement, the client or designated representative did not indicate that active mitigation systems were currently in operation at the property.

The property is located within an EPA Zone 1 county.

EPA Zones:

- Zone 1- Average radon levels at or above 4.0 pCi/L
- Zone 2- Average radon levels between 2.0 and 3.9 pCi/L
- Zone 3- Average radon levels at or below 1.9 pCi/L

The EPA Radon Zone designation should not be used to determine if a property should be tested. All buildings should be tested for radon, regardless of location or EPA Radon Zone designation.

1.3 Measurement Summary

The measurement was conducted between September 26 and 29, 2025, and was requested as part of a due diligence project being conducted by the client. A total of 30 measurement devices to be deployed in 21 residential and 9 non-residential locations in 1 building were included in the measurement and quality assurance project plan. A determination was made that 3 locations on the measurement and quality assurance plan are not testable. The measurement included no vacant locations. For quality assurance purposes, 4 duplicate and 3 field blank measurement devices were deployed. All devices were sent under appropriate chain of custody to a qualified analytical laboratory for analysis.

Findings and recommendations regarding the analytical lab results and corresponding assessment are provided in Section 6.1 of this report.

Section 2.0 – Scope of Work

The assessment includes the following scope of work components:

1. Conducting an initial planning meeting with the client to review the project scope, information necessary to build the measurement and quality assurance project plan, required conditions and on-site logistics.

2. Preparing and implementing a measurement and quality assurance project plan for the assessment, in accordance with the required measurement protocol.

3. Placing and retrieving the measurement devices, preparation of chain of custody documentation and shipping of the devices to a qualified analytical laboratory for analysis, and interpretation of the analytical laboratory data.

4. Providing the client with a written report of the measurement findings and recommendations.

Section 3.0 – Measurement Protocol and Quality Assurance

The measurement was conducted in accordance with the document *Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial and Mixed-Use Buildings (ANSI/AARST MA-MFLB-2023)* by Shad Evans, a radon measurement professional credentialed by the NRPP and licensed by the state of Ohio. Field Professional certification and licensure documentation is attached as Appendix E to this report.

Quality assurance measures were conducted in accordance with ANSI/AARST MA-MFLB-2023. Details regarding the QA procedures implemented for this project are included in Appendix C of this report.

Section 4.0 – Measurement Devices

Air Chek Pro Chek activated charcoal devices manufactured by Air Chek, were utilized for the measurement. All devices were forwarded under appropriate chain of custody for analysis by Air Chek, an analytical laboratory credentialed by the NRPP and licensed by the state of Ohio. Each device was deployed in accordance with the instructions provided by the manufacturer. The chain of custody for measurement devices is available on request.

Air Chek
1936 Butler Bridge Road
Mills River, NC 28759
NRPP License Number: 101138-AL
Ohio License Number: RL10

Section 5.0 – Measurement Conditions

The occupant of each location at the property was notified of the required measurement conditions to be maintained during the testing event prior to device placement. The field professional also delivered notification of the required measurement conditions applicable to the testing event at the time of device placement. In addition, the responsible party for the overall testing event was notified of the required measurement conditions to be maintained during the testing event prior to device placement. Notifications are attached as Appendix G to this report.

Compliance with the measurement conditions and non-interference controls contained within the measurement protocol was verified by the field professional placing and retrieving the measurement devices. At the time of the measurement, violations of the required measurement conditions or evidence of device tampering were not observed by the field professional, unless noted within this report. Modifications to the measurement and quality assurance project plan were not made by the field professional, unless noted within this report. Weather conditions that existed during the measurement event are attached as Appendix D to this report.

Section 6.0 – Findings, Recommendations and Required Advisories

The sole purpose of this assessment is to provide the client with information regarding the indoor radon concentrations at the property at the time of the measurement. An uncertainty with any test result due to statistical variations and other factors, such as daily and seasonal variations in indoor radon concentrations, does exist. Variations may occur due to changes in weather conditions, building usage or possible unobserved interference with the required measurement conditions. Locations not occupied, able to be occupied or inaccessible at the time of the measurement were not tested. Any location not occupied, able to be occupied or inaccessible at the time of the measurement should be tested to ensure radon levels are below the EPA action level prior to future occupancy or upon accessibility, as applicable. The findings and recommendations contained within this report are derived

from information obtained from the client and their designated representative, the on-site activities and analytical services provided under the scope of work performed. No representation is made in this report regarding the operational status or proper operation of any mitigation system(s) that may be installed at the property. This measurement assessment report was prepared solely for the use of the client. Use of this report by any party other than is prohibited without prior written consent from Protect Environmental.

6.1 Findings and Recommendations

Based upon the analytical lab results, the locations contain indoor radon concentrations below the EPA action level of 4.0 pCi/L. The quality assurance plan for the project was in control. No additional action is recommended.

6.2 Required Advisories

The client and/or property owner has the responsibility to identify and comply with local statutes regarding obligations that may exist for disclosing measurement results to occupants and/or affected third parties.

When a location is indicated to have radon levels below the EPA action level of 4.0 pCi/L:

1. If the location is indicated to have radon levels below the EPA action level of 4.0 pCi/L but at or above 2.0 pCi/L, consider mitigation of the building.

2. When the initial measurement is conducted under non-heating season conditions, follow-up measurement of all buildings under heating season at the earliest opportunity, and no later than 5 years after the initial measurement is recommended.

3. Consideration is recommended to alternate future measurements to obtain results under a different season that represents a significant portion of the yearlong operating condition for the building.

4. A follow-up measurement is recommended at least every 5 years and in conjunction with the sale of a building(s); a new addition is constructed or significant alterations occur; a ground-contact location not previously tested is occupied; HVAC systems are altered with resulting changes to air distribution or pressure relationship; ventilation is altered by extensive weatherization or changes to mechanical systems; sizeable openings due to ground water or slab surface water control systems are added or altered; natural settlement causing major cracks develops; earthquakes or construction blasting occur nearby; a mitigation system is altered, repaired or modified.

Appendix A

Analytical Laboratory Report

** LABORATORY ANALYSIS REPORT **

P5179 / KYLE HOYLMAN / PROTECT ENVIRONMENTAL

Kit Number	Start Date	Start Time	End Date	End Time	Temp.	Facility	Building	Room	Project ID	Floor	Result
12208402	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		ELEVATOR LOUNGE		1	0.9
12208403	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		203		2	< 0.3
12208411	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		312		3	0.5
12208415	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		217		2	0.5
12208417	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		114		1	< 0.3
12208418	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		114		1	1.6
12208419	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		SITTING ROOM NEAR 117		1	1.2
12208420	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		SITTING ROOM NEAR 117		1	1.3
12208421	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		311		3	0.6
12208422	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		109		1	1.3
12208423	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		117		1	2.1
12208424	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		111		1	1.3
12208426	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		110		1	1.7
12208428	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		106		1	0.7
12208429	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		108		1	2.1
12208430	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		103		1	1.1
12208431	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		SITTING ROOM NEAR 114		1	1.3
12208432	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		115		1	1.1
12208433	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		214		2	< 0.3
12208435	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		107		1	1.2
12208436	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		107		1	< 0.3
12208437	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		103		1	1.1
12208438	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		LEASING OFFICE		1	0.8
12208440	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		102		1	1.3
12208441	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		113		1	1.5
12208442	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		LOUNGE		1	1.0
12208443	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		110		1	1.8
12208444	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		105		1	0.9
12208445	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		112		1	2.3
12208446	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		LEASING OFFICE		1	< 0.3
12208447	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		300		3	< 0.3
12208448	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		RESOURCE OFFICE		1	1.5
12208451	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		116		1	1.7
12208452	2025-09-26	11:00 am	2025-09-29	2:00 pm	70	ST. THERESA VILLAGE		116		1	1.8

Appendix B

Device Placement Log

Device Placement Log

Facility:	St. Theresa Village			RES Devices:	21	Placement Arrival:	10:30 AM
Address:	6783 Siebern Avenue, Silverton, OH 45236			NR Devices:	9	Placement Departure:	11:10 AM
Contact:	site# - 513-793-0564			Duplicate Devices:	4	Retrieval Arrival:	1:35 PM
Placement Day/Type/Pro:	9/26/2025	ST	Shad Evans	Blank Devices:	3	Retrieval Departure:	2:45 PM
Retrieval Day/Type/Pro:	9/29/2025	ST	Shad Evans	Total Devices:	37	Ship Info:	FedEx: 1-Day
Standard:	MA-MFLB-2023	Project Type:	HUD, Initial 100%	Shipped Devices:	34	Ship Date:	9/30/2025

Kit Number	Start Date	Start Time	End Date	End Time	Temp	Building	Room	Floor	Vacant	Notes
NA	NA	NA	NA	NA	NA		Corridor 155	1		DNP: NTA
NA	NA	NA	NA	NA	NA		Corridor 156	1		DNP: NTA
12208402	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		Elevator Lounge	1		
12208438	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		Leasing Office	1		
12208446	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		Leasing Office FIELD BLANK	1		
12208442	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		Lounge	1		
NA	NA	NA	NA	NA	NA		Maintenance	1		DNP: NTA
12208420	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		Sitting Room near 117	1		
12208419	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		Sitting Room near 117 DUPLICATE	1		
12208431	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		Sitting Room near 114	1		

12208448	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		Resource Office	1		
12208440	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		102	1		
12208430	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		103	1		
12208437	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		103 DUPLICATE	1		
12208444	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		105	1		
12208428	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		106	1		
12208435	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		107	1		
12208436	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		107 FIELD BLANK	1		
12208429	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		108	1		
12208422	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		109	1		
12208426	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		110	1		
12208443	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		110 DUPLICATE	1		
12208424	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		111	1		

12208445	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		112	1		
12208441	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		113	1		
12208418	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		114	1		
12208417	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		114 FIELD BLANK	1		
12208432	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		115	1		
12208452	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		116	1		
12208451	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		116 DUPLICATE	1		
12208423	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		117	1		
12208403	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		203	2		
12208433	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		214	2		
12208415	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		217	2		
12208447	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		300	3		
12208421	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		311	3		

12208411	9/26/2025	11:00 AM	9/29/2025	2:00 PM	70		312	3		

Appendix C

Quality Assurance Documentation

Project Quality Assurance

Quality Assurance measures were conducted in accordance with ANSI/AARST MA-MFLB-2023, and included:

•*Duplicate* (co-located) measurement devices deployed at a rate of 10% of the measurement locations.
- Results may not be twice or more than the co-located sample.

•*Blank* measurement devices, not exposed to indoor air, deployed at a rate of 5% of measurement locations.
- Results may not be above the calculated lower limit of detection.
- At a minimum of 50 test devices deployed, the number of blanks will be increased to 9, to include 3 laboratory blanks, 3 office blanks and 3 field blanks.
- If more than 180 test devices are deployed, the blanks will be deployed at a standard rate of 5% blanks of the measurement locations.

•*Spike* measurement devices conducted at a rate of no less than 3% of sampling locations.
- At a minimum of 100 units tested, the number of spikes increased to include 3 spiked devices from the sampling program batch to be tested and results received prior to beginning the sample deployment.

Device Location	Event Dates	Device Number	Result (pCi/L)		RPD	Device Type
Sitting Room neat 117	9/26/2025 to 9/29/2025	12208419 12208420	1.2 1.3	1.3	NA	Duplicate
Unit 103	9/26/2025 to 9/29/2025	12208430 12208437	1.1 1.1	1.1	NA	Duplicate
Unit 110	9/26/2025 to 9/29/2025	12208426 12208443	1.7 1.8	1.8	NA	Duplicate
Unit 116	9/26/2025 to 9/29/2025	12208451 12208452	1.7 1.8	1.8	NA	Duplicate

Leasing Office	9/26/2025 to 9/29/2025	12208446	< 0.3	NA	Field Blank
Unit 107	9/26/2025 to 9/29/2025	12208436	< 0.3	NA	Field Blank
Unit 114	9/26/2025 to 9/29/2025	12208417	< 0.3	NA	Field Blank

PE Job Number: 25.28

Device Range: 12207001-12209000

Chamber Job Number: 20006022			
Start Date:	9/27/2025	Start Time:	7:07 AM
Stop Date:	9/29/2025	End Time:	7:07 AM
Temperature:	70.2° F	Rel. Hum:	46.3%

Spikes

Device	Type	Manufacture	Range	Chamber	MV	TV	IRE
12207001	AC	Air Chek	12207001-12209000	Bowser-Morner	11.2	13.1	-14.5%
12207101	AC	Air Chek	12207001-12209000	Bowser-Morner	10.7	13.1	-18.3%
12207401	AC	Air Chek	12207001-12209000	Bowser-Morner	10.7	13.1	-18.3%
12207501	AC	Air Chek	12207001-12209000	Bowser-Morner	12.6	13.1	-3.8%
12207801	AC	Air Chek	12207001-12209000	Bowser-Morner	9.8	13.1	-25.2%
12207901	AC	Air Chek	12207001-12209000	Bowser-Morner	10.6	13.1	-19.1%
12208201	AC	Air Chek	12207001-12209000	Bowser-Morner	10.7	13.1	-18.3%
12208301	AC	Air Chek	12207001-12209000	Bowser-Morner	10.9	13.1	-16.8%
12208601	AC	Air Chek	12207001-12209000	Bowser-Morner	10.6	13.1	-19.1%
12208701	AC	Air Chek	12207001-12209000	Bowser-Morner	11.3	13.1	-13.7%

IRE = Individual Relative Error; MV = Measurable Value (from lab); TV = Target Value (from chamber)

Blank Device Information			
Start Date:	9/27/2025	Start Time:	7:07 AM
Stop Date:	9/29/2025	End Time:	7:07 AM
Temperature:	70-75° F	Rel. Hum:	30-45%

Office/Lab Transit Blanks

Device	Type	Manufacture	Range	Chamber	MV	TV	In Control
12108801	AC	Air Chek	12207001-12209000	Bowser-Morner	< 0.3	< 0.3	YES
12207301	AC	Air Chek	12207001-12209000	Bowser-Morner	< 0.3	< 0.3	YES
12207701	AC	Air Chek	12207001-12209000	Bowser-Morner	< 0.3	< 0.3	YES
12208101	AC	Air Chek	12207001-12209000	Bowser-Morner	< 0.3	< 0.3	YES
12208401	AC	Air Chek	12207001-12209000	Bowser-Morner	< 0.3	< 0.3	YES

Winnie Cheuvront

Manager, QA/AC - Measurement

Appendix D

Measurement Event Weather Conditions

PROTECT ENVIRONMENTAL

Facility: St. Theresa Village
Address: 6783 Siebern Avenue, Silverton, OH 45236
Placement Day: 9/26/2025
Retrieval Day: 9/29/2025

Date	Temperature (°F) Min	Temperature (°F) Max	Temperature (°F) Avg	Precipitation (Inches) Min	Precipitation (Inches) Max	Precipitation (Inches) Avg	Ground Cover (Snow/Ice inches) Min	Ground Cover (Snow/Ice inches) Max	Ground Cover (Snow/Ice inches) AVG	Humidity (%) Min	Humidity (%) Max	Humidity (%) Avg	Wind (Speed in mph) Min	Wind (Speed in mph) Max	Wind (Speed in mph) Avg
9/25/2025	64	75	70	0	0	0	0	0	0	64	97	81	0	9	5
9/26/2025	57	79	68	0	0	0	0	0	0	64	97	81	0	9	5
9/27/2025	57	82	70	0	0	0	0	0	0	64	97	81	0	10	5
9/28/2025	50	80	65	0	0	0	0	0	0	50	100	75	0	17	9
9/29/2025	59	79	69	0	0	0	0	0	0	40	100	70	0	12	6
Overall Avg.	57	79	68	0	0.00	0	0	0	0	56	98	77	0	11	6

Table A-0 **Climate Zone Overview—Quick Reference***

	Zone 8 Subarctic		Zone 7 Very Cold		Zone 6 Cold		Zone 5 Cool		Zone 4 Mixed		Zone 3 Warm		Zone 2 Hot		Zone 1 Very Hot		Acutely Hot	
	Annual Average Outdoor Temperatures																	
*Home & Work**	*Hm*	*Wk*	*Hm*	*Wk*	*Hm*	*Wk*	*Hm*	*Wk*	*Hm*	*Wk*	*Hm*	*Wk*	*Hm*	*Wk*	*Hm*	*Wk*	*Hm*	*Wk*
	27 F	**32 F**	**39 F**	**45 F**	**45 F**	**50 F**	**49 F**	**54 F**	**55 F**	**59 F**	**62 F**	**67 F**	**69 F**	**73 F**	**76 F**	**80 F**	**83 F**	**86 F**
	-3	0 C	4 C	7 C	7 C	10 C	9 C	12 C	13 C	15 C	17 C	19 C	21 C	23 C	24 C	27 C	28 C	30 C
% per year	100 %	92 %	83 %	75 %	75 %	66 %	75 %	66 %	66 %	58 %	58 %	42 %	42 %	25 %	50 %	25 %	100 %	100 %
Heating	< Freezing	< Freezing																
Cooling														33 %		75 %		
Neither												25 %	16 %		50 %			
										16 %	16 %		42 %	42 %				
				25 %	25 %	16 %	25 %	16 %	16 %	25 %	25 %	33 %						
		8%	16 %			16 %		16 %	16 %									

Appendix E

Professional Certification Documentation

Wilmington, NC

Katherine Hall-Wurst
Protect Environmental

Total NRPP Training/Education Hours: 16

Certified as a Radon Measurement Professional

- Certified by the National Radon Proficiency Program **(NRPP)**
- NRPP Certification **#114751-RMP**
- Certified since: December 17, 2024
- Certification Expires: December 31, 2026

Business Links

- Protect Environmental Website

North Carolina

State Radon Office Contact

W. Lee Cox, Chief

lee.cox@dhhs.nc.gov

(919) 814-2252

Radon Office Website

Interested in becoming a Member of AARST?

Interested in becoming NRPP certified ?

Radon Levels in your state

Shad M. Evans
Protect Environmental

Total NRPP Training/Education Hours: 200

- Multi-Family Mitigation Certificate **(MFMT)**

Certified as a Radon Measurement Professional

- Certified by the National Radon Proficiency Program **(NRPP)**
- NRPP Certification **#107790-RMP**
- Certified since: October 30, 2014
- Certification Expires: October 31, 2025
- ***** The state of Ohio requires that all contractors, performing radon related services within the state, be licensed.**
- ***** Please check with your State Radon Office for current licensing information.**

Certified as a Radon Mitigation Specialist

- Certified by the National Radon Proficiency Program **(NRPP)**
- NRPP Certification **#107791-RMS**
- Certified since: October 30, 2014
- Certification Expires: October 31, 2025
- ***** The state of Ohio requires that all contractors performing radon related services within the state, be licensed by the state.**
- ***** Please check with your State Radon Office for current licensing information.**

Indoor Environments Association (formerly AARST)

- AARST Member ID: A2216

Ohio

State Radon Office Contact

Gene Phillips, Chief

indoor.radon@odh.ohio.gov

(614) 728-0272

Radon Office Website

Interested in becoming a Member of AARST?

STATE OF OHIO
DEPARTMENT OF HEALTH

Bureau of Environmental Health and Radiation Protection

Indoor Radon Program

Hereby Approves:

Shad M Evans
203 East Weber Road

Columbus, OH 43202

as a

Radon Mitigation Specialist

This license is issued pursuant to Chapter 3723 of the Ohio Revised Code and 3701-69 of the Ohio Administrative Code and in reliance upon statements and representations made heretofore by the licensee.

License Number: **RS157**

Amendment Number: **10**

Expiration Date: **10/3/2026**

In witness thereof:

Bruce Vanderhoff, MD, MBA
Director of Health

Fold

Your license card is valid for a period of two (2) years, as indicated by the expiration date on the card. Your card must be present on any project site where you are conducting radon-related work.

All questions regarding your license should be directed to (614) 752-4425

To verify licensure please visit: www.odh.ohio.gov

If found, please return to: Ohio Department of Health
246 North High Street
Columbus, OH 43215

HEA 5520 11/11

2461316

State of Ohio - Department of Health

Bureau of Environmental Health and Radiation Protection

Radon Mitigation Specialist

Shad M Evans
203 East Weber Road

Columbus, OH 43202

License Number **RS157**
Amendment # **10**

Expiration Date **10/3/2026**

This license is issued pursuant to Chapter 3723 of the Ohio Revised Code and 3701-69 of the Ohio Administrative Code

Appendix F

EPA Radon Zone Map

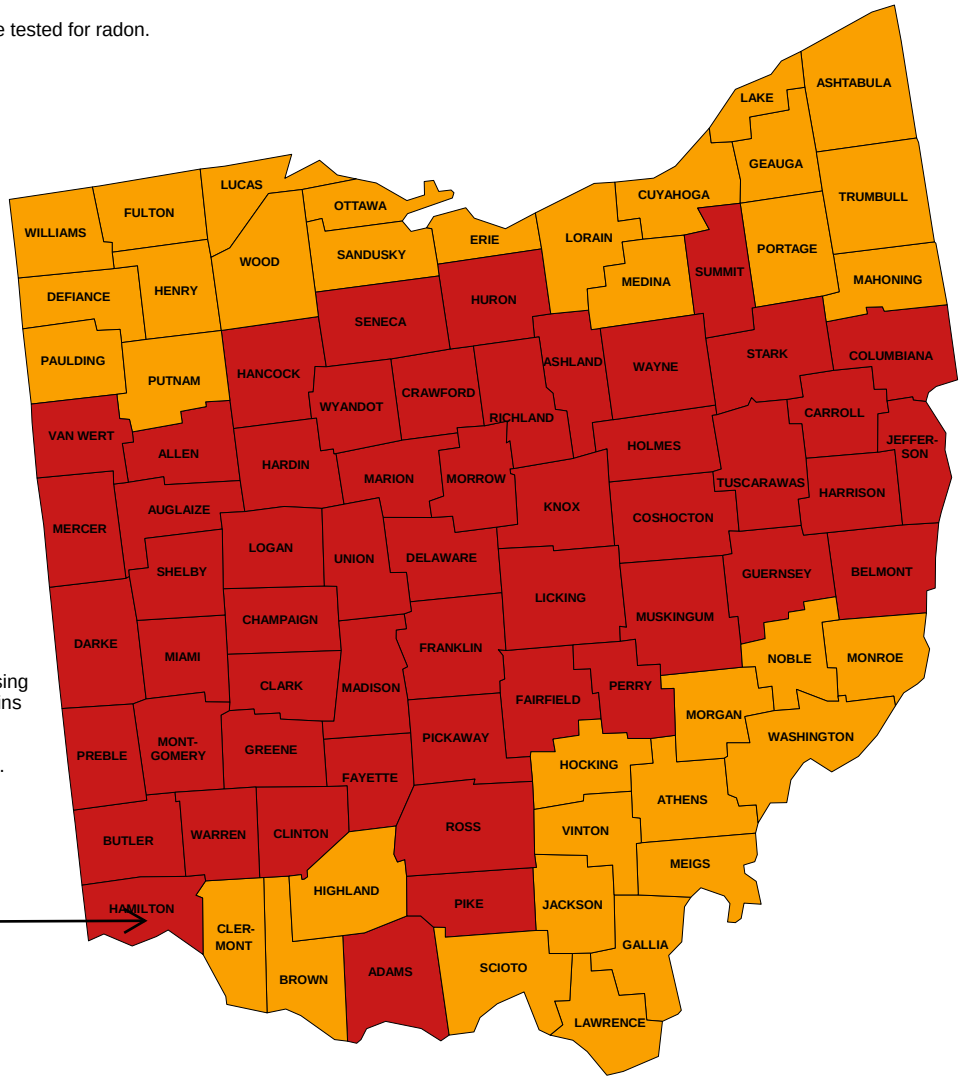
OHIO - EPA Map of Radon Zones

http://www.epa.gov/radon/zonemap.html

The purpose of this map is to assist National, State and local organizations to target their resources and to implement radon-resistant building codes.

This map is not intended to determine if a home in a given zone should be tested for radon. Homes with elevated levels of radon have been found in all three zones.

All homes should be tested, regardless of zone designation.



IMPORTANT: Consult the publication entitled "Preliminary Geologic Radon Potential Assessment of Ohio" (USGS Open-file Report 93-292-E) before using this map. http://energy.cr.usgs.gov/radon/grpinfo.html This document contains information on radon potential variations within counties. EPA also recommends that this map be supplemented with any available local data in order to further understand and predict the radon potential of a specific area.

Property Location

Zone 1 Zone 2 Zone 3

Appendix G

Notification Documentation

Scan for Additional Languages

Radon Measurement – Resident Notification (ST)

We will be conducting a radon assessment in your community. Your residence may be selected for placement of a measurement device. Access to your residence for purposes of placing and retrieving the measurement device may be necessary on the following dates:

Device Placement: **09/26/2025**

Device Retrieval: **09/29/2025**

During the measurement period, regardless of whether a measurement device is placed in your residence, you are required to maintain the following conditions to ensure a valid measurement:

- All windows must be kept closed. All exterior doors must be kept closed, except for normal entry and exit. **Windows and doors must be kept closed for a period of 12 hours prior to the device placement date and remain closed effect until the devices are retrieved.**

- Whole house fans must not be operated. Window air conditioning units may only be operated in recirculation mode. Portable window fans must be removed from the window or sealed in place.

- Fireplaces or combustion appliances, other than water heaters and cooking appliances, must not be operated unless they are your primary heat source.

- Ceiling fans, portable air filters, portable de-humidifiers, portable humidifiers or window air conditioning units operating in recirculation mode must not be operated within 20’ of the measurement device.

- If a device is placed in your unit, the measurement device must not be touched, tampered with, covered, removed, or altered, and the location of the device must not be changed. Your HVAC system must be operated in the normal range – your thermostat should not be adjusted drastically, and your fan should be set in normal mode.

The technician placing and retrieving the devices is required to report any failure to maintain closed-building conditions. Failure to maintain these conditions could result in an invalid measurement and require the measurement to be repeated.

Your assistance in helping to ensure a valid measurement in greatly appreciated! Contact your management office with questions regarding this notification.

Thank you.

PROTECT™
ENVIRONMENTAL

Radon Measurement – Responsible Party Notification (ST)

Date: September 22, 2025
Measurement Location: St. Theresa Village, 6783 Siebern Avenue, Silverton, OH 45236
Measurement Period: 09/26/2025 through 09/29/2025

During the measurement period, the following conditions must be maintained in each residence (regardless of whether or not the unit contains a measurement device) and all common areas in the building to ensure a valid measurement:

- All windows must be kept closed. All exterior doors must be kept closed, except for normal entry and exit. **Windows and doors must be kept closed for a minimum period of 12 hours prior to device placement and remain closed until device retrieval.**

- Whole house fans must not be operated. Window air conditioning units may only be operated in recirculation mode. Portable window fans must be removed from the window or sealed in place.

- Fireplaces or combustion appliances, other than water heaters and cooking appliances, must not be operated unless they are the primary heat source.

- Ceiling fans, portable air filters, portable de-humidifiers, portable humidifiers or window air conditioning units operating in recirculation mode must not be operated within 20' measurement devices.

- The measurement device must not be touched, tampered with, covered, removed or altered, and the location of the device must not be changed. HVAC systems must be operated in the normal range – thermostats should not be adjusted drastically and air handlers should be set in normal mode.

- Unusual occurrences that could affect the measurement, such as power outages or extreme weather conditions, must be reported to Protect Environmental.

The technician placing and retrieving the devices is required to report any failure to maintain measurement conditions. Failure to maintain measurement conditions may result in an invalid measurement and require the measurement to be repeated.

As the responsible party for the measurement location listed above, I hereby acknowledge receipt of this Measurement Conditions Notification and agree to make reasonable efforts to ensure the conditions outlined herein are maintained throughout the measurement period.

_____
Responsible Party

Appendix L:

Hamilton County Water Quality Report 2024

ANNUAL WATER QUALITY REPORT

Reporting Year 2024

Presented By

Hamilton Public Water System

PWS ID#: OH0904012

Our Commitment

We are pleased to present to you this year's annual water quality report. This report is a snapshot of last year's water quality covering all testing performed between January 1 and December 31, 2024. Included are details about your sources of water, what it contains, and how it compares to standards set by regulatory agencies. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water and providing you with this information because informed customers are our best allies.

Where Does My Water Come From?

City of Hamilton water customers are fortunate because we enjoy an abundant water supply from the Great Miami Buried Valley Aquifer. The city meets 100 percent of customer drinking water needs with this groundwater. The sand-and-gravel aquifer was formed by glaciers covering Ohio as recently as 10,000 years ago and serves as the primary source of drinking water for many communities in southwest Ohio. This aquifer holds about 1.5 trillion gallons and is constantly being replenished from various sources. Our water is pulled from about 210 feet below the surface. This groundwater has traveled for miles deep underground, naturally filtered by sand and gravel.

Hamilton pumps groundwater to the North and South Water Treatment Plants using large-capacity wells located in Hamilton and the City of Fairfield. The North Water Treatment Plant was constructed in 1935, and the South Water Treatment Plant was constructed in 1953. Combined, our treatment facilities provided roughly 6.09 billion gallons of clean drinking water in 2024.

Water Treatment Process

The treatment process consists of a series of steps. First, raw water is drawn from our deep wells and sent to the aerators, which allows the dissolved gas to release in the atmosphere and for the oxidation of any soluble metals, such as iron and manganese. The water then goes to the solids contact clarifiers, where lime (calcium oxide, or CaO) is added. Flocculation occurs in the center zone where the lime slurry contacts the raw water. This flocculation zone is baffled and has a diameter of 21 feet.

The water then passes upward through a sludge blanket, where the agglomerated floc particles become heavier and fall to the bottom of the basin to form sludge. A large mixer circulates the water and sludge, maintaining the reaction. The heavy solids settle to the bottom, and the clear water rises to the top of the basins and is collected through a series of radial launders.

At this point, the water flows to the recarbonation basins, where carbon dioxide is added to adjust pH. Then the water is filtered through layers of anthracite coal and silicate sand. As smaller suspended particles are removed, turbidity disappears and clear water collects in the underdrain system and flows to the clearwell, where we add chlorine dioxide for disinfection and fluoride to prevent tooth decay in children. Finally, water is pumped out to our distribution system and storage reservoirs via large-capacity, high-service pumps.

Water Main Flushing

Distribution mains (pipes) convey water to homes, businesses, and hydrants in your neighborhood. The water entering distribution mains is of very high quality; however, water quality can deteriorate in areas of the distribution mains over time. Water main flushing is the process of cleaning the interior of water distribution mains by sending a rapid flow of water through them.

Flushing maintains water quality in several ways. For example, flushing removes sediments like iron and manganese. Although iron and manganese do not pose health concerns, they can affect the taste, clarity, and color of the water. Additionally, sediments can shield microorganisms from the disinfecting power of chlorine, contributing to the growth of microorganisms within distribution mains. Flushing helps remove stale water and ensures the presence of fresh water with sufficient dissolved oxygen and disinfectant levels and an acceptable taste and smell.

During flushing operations in your neighborhood, some short-term deterioration of water quality, though uncommon, is possible. You should avoid tap water for household uses at that time. If you do use the tap, allow your cold water to run for a few minutes at full velocity before use, and avoid using hot water to prevent sediment accumulation in your hot water tank. Please contact us if you have any questions or if you would like more information on our water main flushing schedule.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health-care providers. U.S. Environmental Protection Agency (U.S. EPA)/Centers for Disease Control and Prevention (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or epa.gov/safewater.

Questions?

For more information about this report, or for any questions relating to your drinking water, please call Jay Mosley, Water Production Superintendent, at (513) 785-7429.

Substances That Could Be in Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic Contaminants, such as salts and metals, which can occur naturally in the soil or groundwater or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and Herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and can also come from gas stations, urban stormwater runoff, and septic systems.

Radioactive Contaminants, which can occur naturally or as the result of oil and gas production and mining activities.

To ensure that tap water is safe to drink, U.S. EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily mean that water poses a health risk. More information about contaminants and potential health effects can be obtained by contacting the U.S. EPA by calling the Safe Drinking Water Hotline at (800) 426-4791 or visiting epa.gov/safewater.

Source Water Assessment

Ohio EPA completed a study of Hamilton's North and South Wellfields to determine susceptibility to contamination. According to this study, the aquifer that supplies water to Hamilton's wells has a high susceptibility to contamination. This determination is based on (1) lack of a protective layer of clay, (2) shallow depth of the aquifer, and (3) the presence of significant potential contaminant sources in the protection area.

To help ensure groundwater quality, the city is a member of a comprehensive source water protection program called the Hamilton to New Baltimore Groundwater Consortium that includes education, source control strategies, groundwater monitoring, and a contingency and emergency response plan. This program was developed in conjunction with the City of Cincinnati, City of Fairfield, and other local groundwater producers. We are known nationally for our protective strategies, youth and adult education outreach, and raising awareness about protecting our water source.

For more information on the city's source water protection program and the source water assessment report, please contact the groundwater consortium manager, Tim McLelland, at (513) 785-2464, or visit the Groundwater Consortium website at gwconsortium.org.

Public Meetings

We encourage public interest and participation in our community's future. City council meetings are held on the second and fourth Wednesday of the month at 6:00 p.m. in Council Chambers at 345 High Street. The Public Utilities Commission meets generally the second Thursday of the month at 1:15 p.m. in the conference room at the City Garage, 2210 South Erie Boulevard. The public is welcome.

Lead in Home Plumbing

If present, lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. City of Hamilton is responsible for providing high quality drinking water and removing lead pipes, but cannot control the variety of materials used in plumbing components in your home. You share the responsibility for protecting yourself and your family from the lead in your home plumbing. You can take responsibility by identifying and removing lead materials within your home plumbing and taking steps to reduce your family's risk. Before drinking tap water, flush your pipes for several minutes by running your tap, taking a shower, doing laundry or a load of dishes. You can also use a filter certified by an American National Standards Institute accredited certifier to reduce lead in drinking water. If you are concerned about lead in your water and wish to have your water tested, contact City of Hamilton Water Production at (513) 785-7430. Additionally, a list of laboratories certified in Ohio to test for Lead my be found at epa.ohio.gov/ddagw or by calling (614) 664-2752. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available at http://www.epa.gov/safewater/lead.

Per the Lead and Copper Rules, public water systems were required to develop and maintain a service line inventory. A service line is the underground pipe that supplies your home or building with water. To view the service line inventory, which lists the material types for your location, you can visit Hamilton's Lead Awareness webpage at hamilton-oh.gov/lead-awareness or cohohio.maps.arcgis.com/apps/webappviewer/index.html?id=eb0faa30aa3e41e788f71d8ae4d4cf5d.

Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule and must meet specific health standards. We are pleased to report that your drinking water meets or exceeds all federal and state requirements. Here, we only show those substances that were detected in our water (a complete list of all our analytical results is available upon request). Remember that detecting a substance does not mean the water is unsafe to drink; our goal is to keep all detects below their respective maximum allowed levels.

Note that we have a current, unconditioned license to operate our water system.

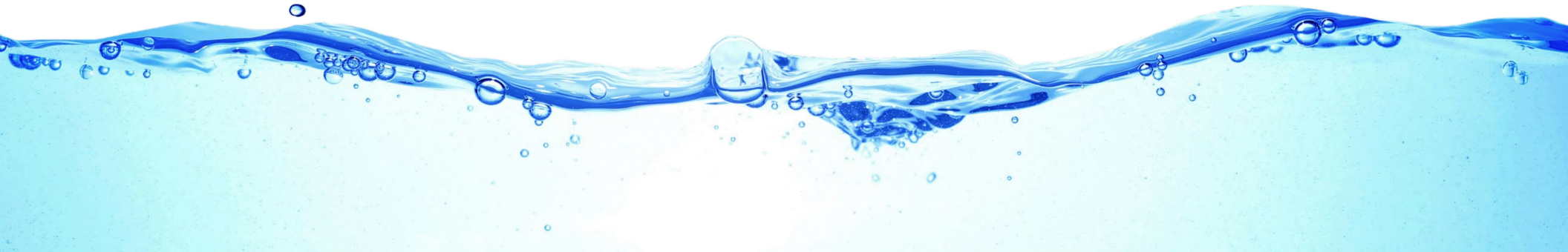
The state recommends monitoring for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data is included, along with the year in which the sample was taken.

REGULATED SUBSTANCES

				South Plant		North Plant			
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Alpha Emitters (pCi/L)	2020	15	0	2.8 +- 1.99	NA	0.162 +- 1.24	NA	No	Erosion of natural deposits
Antimony (ppb)	2020	6	6	NA	NA	0.55	NA	No	Discharge from petroleum refineries; Fire retardants; Ceramics; Electronics; Solder
Barium (ppm)	2023	2	2	0.0527	NA	0.0335	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine Dioxide (ppb)	2024	[800]	[800]	510	210–510	590	220–590	No	Water additive used to control microbes
Chlorite (ppm)	2024	1	0.8	0.63	0.06–0.82	0.55	0.35–0.60	No	By-product of drinking water disinfection
cis-1,2-Dichloroethylene (ppb)	2024	70	70	NA	NA	0.09	NA	No	Discharge from industrial chemical factories
Combined Radium (pCi/L)	2020	5	0	0.673 +- 0.47	NA	0.152 +- 0.297	NA	No	Erosion of natural deposits
Cyanide (ppb)	2024	200	200	NA	NA	ND	NA	No	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories
Fluoride (ppm)	2024	4	4	0.87	0.7–1.11	0.71	0.64–0.91	No	Erosion of natural deposits; Water additive that promotes strong teeth; Discharge from fertilizer and aluminum factories
Nitrate (ppm)	2024	10	10	0.58	NA	ND	NA	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH %ILE)	RANGE LOW-HIGH	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2024	1.3	1.3	0.032	0.002–0.112	0/33	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2024	15	0	2	ND–3.4	0/33	No	Lead service lines; Corrosion of household plumbing systems including fittings and fixtures; Erosion of natural deposits



UNREGULATED SUBSTANCES INCLUDING UCMR5

		South Plant		North Plant		Distribution System (North & South Plants)		
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Chloroform (ppb)	2023	NA	NA	NA	NA	0.09	0.08–0.09	By-product of drinking water chlorination
Perfluorobutanesulfonic Acid [PFBS] (ppt)	2024	3.6	ND–3.6	ND	NA	NA	NA	Human-made chemicals used in consumer products, usually in the manufacture of nonstick coatings, clothing, carpets, and food wrappers
Perfluorohexanesulfonic Acid [PFHxS] (ppt)	2024	4.4	ND–4.4	ND	NA	NA	NA	Human-made chemicals used in consumer products, usually in the manufacture of nonstick coatings, clothing, carpets, and food wrappers
Perfluorooctanoic Acid [PFOA] (ppt)	2024	5.3	ND–5.3	ND	NA	NA	NA	Human-made chemicals used in consumer products, usually in the manufacture of nonstick coatings, clothing, carpets, and food wrappers
Sulfate (ppm)	2020	NA	NA	NA	NA	55.6	NA	Naturally present in soil and rocks; Certain industrial processes; Sewage treatment; Landfills; Industrial waste sites

Definitions

90th %ile: The levels reported for lead and copper represent the 90th percentile of the total number of sites tested. The 90th percentile is equal to or greater than 90% of our lead and copper detections.

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG (Maximum Contaminant Level Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MRDL (Maximum Residual Disinfectant Level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

NA: Not applicable.

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

pCi/L (picocuries per liter): A measure of radioactivity.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

ppt (parts per trillion): One part substance per trillion parts water (or nanograms per liter).

Protecting Your Water

Bacteria are a natural and important part of our world. There are around 40 trillion bacteria living in each of us; without them, we would not be able to live healthy lives. Coliform bacteria are common in the environment and generally not harmful themselves. The presence of this bacterial form in drinking water is a concern, however, because it indicates that the water may be contaminated with other organisms that can cause disease.

In 2016 the U.S. EPA passed a regulation called the Revised Total Coliform Rule, which requires water systems to take additional steps to ensure the integrity of the drinking water distribution system by monitoring for the presence of bacteria like total coliform and *E. coli*. The rule requires more stringent standards than the previous regulation, and it requires water systems that may be vulnerable to contamination to have procedures in place that will minimize the incidence of contamination. Water systems that exceed a specified frequency of total coliform occurrences are required to conduct an assessment and correct any problems quickly. The U.S. EPA anticipates greater public health protection under this regulation due to its more preventive approach to identifying and fixing problems that may affect public health.

Though we are fortunate in having the highest-quality drinking water, our goal is to eliminate all potential pathways of contamination into our distribution system, and this requirement helps us accomplish that goal.

DOMINION
DUE DILIGENCE

ENVIRONMENTAL REVIEW
ST. THERESA VILLAGE
6783 SIEBERN AVENUE
SILVERTON, HAMILTON COUNTY, OHIO 45236

D3G PROJECT NUMBER:
2025-001881

REPORT ISSUE DATE:
OCTOBER 22, 2025

INSPECTION DATE:
SEPTEMBER 23, 2025

PREPARED FOR:
NATIONAL CHURCH RESIDENCES
2245 NORTH BANK DRIVE
COLUMBUS, OHIO 43220

Ed Nikolich
Site Assessor

Signature

Dana Pelkey
Environmental Technician

Signature

Alexis Brass
Environmental Professional

Signature

Robert Hazelton
Principal

Signature

DOMINION
DUE DILIGENCE

EXECUTIVE PROPERTY DESCRIPTION

Property: St. Theresa Village
6783 Siebern Avenue
Silverton, Hamilton County, Ohio 45236

Site Description: The subject property consists of one (1) three-story age-restricted apartment structures constructed in 1996. The subject property structures contain a total of fifty (50) age-restricted residential dwelling units and are situated on approximately 2.171 acres of land. The subject property contains a gross building area of approximately 42,192 square feet. Located within the apartment structure are laundry facilities, a leasing office, maintenance areas, a mail kiosk, a wellness center, a community kitchen and dining area, and storage areas. Exterior property improvements include a maintenance shed, landscaped regions, and asphalt parking areas. The subject property is serviced by electricity, natural gas, and municipally supplied water and sewer. The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex.

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Appendix D: Coastal Barrier Resources
Appendix E: Flood Insurance
Appendix F: Air Quality
Appendix G: Coastal Zone Management
Appendix H: Site Contamination
Appendix I: Endangered Species Act
Appendix J: Explosive and Flammable Hazards
Appendix K: Farmlands Protection
Appendix L: Floodplain Management
Appendix M: Historic Preservation
Appendix N: Noise Abatement and Control
Appendix O: Sole Source Aquifers
Appendix P: Wetlands Protection
Appendix Q: Wild and Scenic Rivers
Appendix R: Housing Requirements

1.0 Compliance with Related Federal Laws and Authorities

The following table summarizes the results of Dominion Due Diligence Group's (D3G's) Environmental Review of the St. Theresa Village located at 6783 Siebern Avenue in Silverton, Hamilton County, Ohio (subject property). The U.S. Housing and Urban Development (HUD) Environmental Review Record Related Federal Laws and Authorities Worksheets are located in the corresponding appendix listed below.

STATUTE/ EXECUTIVE ORDER/ REGULATION	APPENDIX REFERENCE	ACCEPTABLE	COMPLIANCE STEPS/MITIGATION
AIRPORT HAZARDS	C	YES	
COASTAL BARRIER RESOURCES	D	YES	
FLOOD INSURANCE	E	YES	
AIR QUALITY	F	YES	
COASTAL ZONE MANAGEMENT	G	YES	
SITE CONTAMINATION	H	YES	
ENDANGERED SPECIES	I	YES	
EXPLOSIVE AND FLAMMABLE HAZARDS	J	YES	
FARMLANDS PROTECTION	K	YES	
FLOODPLAIN MANAGEMENT	L	YES	
HISTORIC PRESERVATION	M		(1)
NOISE ABATEMENT AND CONTROL	N	YES	
SOLE SOURCE AQUIFERS	O	YES	
WETLANDS PROTECTION	P	YES	
WILD AND SCENIC RIVERS	Q	YES	
HOUSING REQUIREMENTS	R	YES	

The following Related Federal Laws and Authorities were identified in connection with the subject property that require further compliance documentation:

(1) It is the responsibility of HUD to contact any applicable Tribal Historic Preservation Officers (THPO) of any affected tribes, as applicable. D3G has prepared letters for HUD's use in consulting with the THPOs.

2.0 Reference Materials

- U.S. Environmental Protection Agency (EPA) Green Book County-Level Multi-Pollutant Information accessed at http://www.epa.gov/airquality/greenbk/ancl.html
- CBRA information: http://www.fws.gov/CBRA/Maps/index.html
- National Oceanic and Atmospheric Administration - Ocean and Coastal Resource Management accessed at https://coast.noaa.gov/czm/mystate/
- U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Conservation (IPaC) System, accessed at http://ecos.fws.gov/ipac/
- U.S. Census Bureau TIGERweb Geography Division website accessed at http://tigerweb.geo.census.gov/tigerweb/
- FEMA Flood Insurance Rate Map (FIRM) #39061C-0233E dated February 17, 2010
- National Flood Insurance Program (NFIP) Community Status Book accessed at https://www.fema.gov/flood-insurance/work-with-nfip/community-status-book
- Airport information accessed at https://www.airnav.com/airports/search.html
- Federal Aviation Administration website accessed at

  https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=showCircleSearchAirportsForm
- Environmental Data Resources Inc. (EDR) Report, dated September 24, 2025
- U.S. EPA NEPAssist access at http://nepassisttool.epa.gov/nepassist/entry.aspx
- Below provides basic descriptions for the data included in the mapping layers available through NEPAssist that were utilized in this Phase I ESA
- The Airport Polygons layer includes airport boundaries and airport runways within the United States. Source: National Transportation Atlas Database
- The National Register of Historic Places - National Register layer is downloaded from the NPS National Register of Historic Places KML files. Source: http://focus.nps.gov/nrhp/Download?path=/natreg/docs/Download.html
- The Sole Source Aquifer layer includes information on the sole source aquifers (SSA) designated by EPA under section 1424(e) of the Safe Drinking Water Act of 1974. Source: http://catalog.data.gov/dataset
- USFWS National Wetlands Inventory map accessed at http://www.fws.gov/wetlands/Data/Mapper.html
- The Wild and Scenic Rivers layer includes segments of the National Wild and Scenic River System for the United States. Source: http://www.rivers.gov/mapping-gis.php
- National Park Service National Rivers Inventory accessed at https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm
- National Pipeline Mapping System (NPMS) Public Viewer accessed at https://pvnpms.phmsa.dot.gov/PublicViewer/
- Ohio Oil and Gas Wells accessed at https://gis.ohiodnr.gov/MapViewer/?config=oilgaswells

Appendix A:

Site Maps

Appendix A Tax Map	↑ **N**	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio *Parcel #: 602-0001-0059-00*	**DOMINION DUE DILIGENCE GROUP**

Jessica E. Miranda, Hamilton County Auditor

generated on 9/29/2025 12:05:00 PM EDT

Property Report

Parcel ID	Address	Index Order	Tax Year
602-0001-0059-00	6783 SIEBERN AVE	Parcel Number	2024 Payable 2025

Property Information

Tax District 015 - SILVERTON-CINTI CSD
School District CINCINNATI CSD

Images/Sketches

Appraisal Area
60201 - SILVERTON 01
Sales

Auditor Land Use
413 - INDEPENDENT LIVING (SENIO

Owner Name and Address
ST THERESA VILLAGE INC
6783 SIEBERN AVE
CINCINNATI OH 45238
(Questions? 946-4015 or county.auditor@auditor.hamilton-co.org)

Tax Bill Mail Address
ST THERESA VILLAGE
ATTN: ASSET MANAGEMENT
1600 BROADWAY, SUITE 2000
DENVER CO 80202
(Questions? 946-4800 or treasurer.taxbills@hamilton-co.org)

Assessed Value
838,110

Effective Tax Rate
80.906198

Total Tax
$67,927.76

Property Description
SIEBERN AVE 2.105 AC R2-T4-S24 PRS 59-432 CONS

Appraisal/Sales Summary

Year Built	1996
Total Rooms	0
# Bedrooms	0
# Full Bathrooms	0
# Half Bathrooms	0
Last Transfer Date	12/13/1995
Last Sale Amount	$140,000
Conveyance Number	15421
Deed Type	WE - Warranty Deed (EX)
Deed Number	769248
# of Parcels Sold	1
Acreage	2.171

Tax/Credit/Value Summary

Board of Revision	YES(21)
Rental Registration	No
Homestead	No
Owner Occupancy Credit	No
Foreclosure	No
Special Assessments	Yes
Market Land Value	192,920
CAUV Value	0
Market Improvement Value	2,201,690
Market Total Value	2,394,610
TIF Value	0
Abated Value	0
Exempt Value	0
Taxes Paid	$33,963.88

Notes

3/12/24 DV SECTION 8 PER 1/1/24 STATE LIST ** 10/20/21 - decrease to 2,300,000 ** 6/7/21 BOR #20-052528 NO CHANGE JAW ** 6-23-98 BLDG 100% FOR 1998

Structure List

Structure Name	Use Code	Finished Sq. Ft.	Year Built
Structure 1	413 INDEPENDENT LIVING (SENIO	42,252	1996

Commercial Appraisal Data

Section	Occupancy	Finished Area (sq. ft.)	Story Height	Stories
Section 1	313 Convalescent Hospital	14,558	9	1
Section 2	313 Convalescent Hospital	14,332	9	1
Section 3	313 Convalescent Hospital	13,362	9	1

Improvements

Improvement	Measurements	Year Built
525-Asphalt	12000	1996

Proposed Levies

Levy	Levy Type	Mills	Current Annual Tax	Estimated Annual Tax	Note
Cincinnati CSD - Emergency ($48,000,000)	Renewal	5.05	$4,383.32	$4,232.46	B, C
Deer Park-Silverton JFD - Fire & EMS	Additional	3.50	$0.00	$2,933.39	B
Great Parks - Parks	Renewal	1.00	$689.41	$689.41	B, C

Levies Passed - 2025 Pay 2026 Tax Bill

Levy	Levy Type	Mills	Current Annual Tax	Estimated Annual Tax	Note
Silverton - Current Expense	Renewal	5.00	$2,594.60	$2,594.60	A

This is an estimated levy payment based on the current value of your property. Actual tax amounts per tax year may vary based on changes in property valuation and based on whether a parcel receives any abatement, credit, or reduction during the levy period.

Effective for the tax year 2005, Ohio's biennial budget bill, Amended Substitute House Bill 66, signed by the Governor on June 30, 2005, terminates the 10 percent real property tax rollback for the commercial and industrial classes of property, and agricultural property used for the commercial production of timber.

Effective for the tax year 2013, Ohio's biennial budget bill, House Bill 59, signed by the Governor on June 30, 2013, terminates the 10 percent real property tax rollback and the 2.5 percent homestead credit on all additional or replacement levies passed at the November 5, 2013 election or after. As a result of this legislation, those same levies will not qualify for the stadium tax credit.

Existing and renewal levies, as well as levies passed at the May 7,2013 and August 6, 2013 elections will qualify for the credits. Residential and most agricultural properties with qualifying levies will receive what is now the Non-Business Credit Rollback Factor. Owner occupied residential dwellings with qualifying levies will receive what is now the Owner Occupancy Credit Rollback Factor, as well as the stadium tax credit.

Transfer History

Year	Conveyance #	Selling Price	Transfer Date	Previous Owner	Current Owner
1995	15421	140,000	12/13/1995	SEE OWNERSHIP CARD	ST THERESA VILLAGE INC

Value History

Tax Year	Assessed Date	Land	Improvements	Total	CAUV	Reason for Change
2023	7/29/2023	192,920	2,201,690	2,394,610	0	120 Reappraisal, Update or Annual Equalization
2021	10/29/2021	171,010	2,128,990	2,300,000	0	40 Changes by Board of Revision, Tax Appeals, Courts
2020	10/29/2021	171,010	2,128,990	2,300,000	0	40 Changes by Board of Revision, Tax Appeals, Courts
2020	8/22/2020	171,010	2,291,310	2,462,320	0	120 Reappraisal, Update or Annual Equalization
2017	11/15/2017	159,820	2,141,410	2,301,230	0	120 Reappraisal, Update or Annual Equalization
2014	9/19/2014	147,350	2,051,510	2,198,860	0	120 Reappraisal, Update or Annual Equalization
2011	9/5/2011	150,360	2,093,380	2,243,740	0	120 Reappraisal, Update or Annual Equalization
2008	9/27/2008	170,770	1,832,900	2,003,670	0	120 Reappraisal, Update or Annual Equalization
2005	9/28/2005	164,200	1,762,400	1,926,600	0	120 Reappraisal, Update or Annual Equalization
2002	10/8/2002	148,600	1,564,300	1,712,900	0	120 Reappraisal, Update or Annual Equalization
1999	11/6/1999	140,500	1,478,500	1,619,000	0	30 New Construction - Full Value
1999	11/6/1999	140,500	0	140,500	0	120 Reappraisal, Update or Annual Equalization
1998	7/10/1998	140,000	2,513,300	2,653,300	0	30 New Construction - Full Value
1997	11/21/1997	140,000	1,193,800	1,333,800	0	110 Miscellaneous
1997	11/21/1997	147,000	1,193,800	1,340,800	0	110 Miscellaneous
1997	9/2/1997	280,000	1,193,800	1,473,800	0	30 New Construction - Full Value
1997	5/7/1996	280,000	0	280,000	0	50 Changes to/from Exempt Property
1997	5/7/1996	0	0	0	0	110 Miscellaneous
1996	1/1/1996	133,000	0	133,000	0	110 Miscellaneous

Board of Revision Case History

Case Number	Date Filed	Withdrawn	**Counter Complaint Filed	*Hearing Date/Time	Value Challenged	Value Requested	Value Decided by BOR	***Date Resolved
2020052528	4/8/2021	No		6/1/2021 11:00 AM	2,462,320	2,000,000	2,462,320	6/8/2021
2013704719	5/7/2014	Yes	5/7/2014	1/1/1900 12:00 AM	2,243,740	1,109,410		

*Once your hearing has been scheduled, you will receive a **Notice of Hearing** by certified mail or email, and the Scheduled Hearing Date and Time will be populated on this page.
**A counter-complaint may by filed by a party with interest in the value of your property, such as the Board of Education, if you request a decrease.

***Please allow six to eight weeks to receive your **Notice of Result** by certified mail and to see your result on this page. Your Notice will contain basic facts about appealing your Board of Revision decision, should you wish to do so.

Payment Information

JILL A. SCHILLER, TREASURER

Mail Payments to:	Hamilton County Treasurer 138 E. Court Street, Room 402 Cincinnati, Ohio 45202
Tax District:	015 - SILVERTON-CINTI CSD

Current Owner(s)	ST THERESA VILLAGE INC
Tax Bill Mail Address	ST THERESA VILLAGE ATTN: ASSET MANAGEMENT 1600 BROADWAY, SUITE 2000 DENVER CO 80202

Taxable Value	
Land	67,520
Improvements	770,590
Total	838,110

Tax Overview

Tax Lien Pending	No
Tax Lien Sold	No
Full Rate	108.870000
Effective Rate	80.906198
Non Business Credit	0.087124
Owner Occupancy Credit	0.021781
Certified Delinquent Year	
Delinquent Payment Plan	No
TOP (Treasurer Optional Payment) Note: May represent multiple parcels	$0.00

Current Year Tax Detail

	Prior Delinquent	Adj. Delinquent	1st Half	Adj. 1st Half	2nd Half	Adj. 2nd Half
Real Estate			$45,622.52		$45,622.52	
Credit			$11,718.37		$11,718.37	
Subtotal			$33,904.15		$33,904.15	
Non Business Credit			$0.00		$0.00	
Owner Occupancy Credit			$0.00		$0.00	
Homestead			$0.00		$0.00	
Sales CR			$0.00		$0.00	
Subtotal	**$0.00**	**$0.00**	**$33,904.15**	**$0.00**	**$33,904.15**	**$0.00**
Interest/Penalty	$0.00	$0.00	$0.00	$0.00	$3,396.39	$0.00
Real Estate Paid	$0.00		$33,904.15		$0.00	
Real Estate Owed	$0.00		$0.00		$37,294.57	
Special Assess Paid	$0.00		$59.73		$0.00	
Special Assess Owed	$0.00		$0.00		$65.70	
Total Due	$0.00		$33,963.88		$37,360.27	
Total Paid	$0.00		$33,963.88		$0.00	
Unpaid Delq Contract	$0.00		$0.00		$0.00	
Total Owed	**$0.00**		**$0.00**		**$37,360.27**	

Special Assessment Detail for 13-999 STORM WATER

	Prior Delinquent	Adj. Delinquent	1st Half	Adj. 1st Half	2nd Half	Adj. 2nd Half
Charge	$0.00	$0.00	$59.73	$0.00	$59.73	$0.00
Interest/Penalty	$0.00	$0.00	$0.00	$0.00	$5.97	$0.00
Paid	$0.00		$59.73		$0.00	
Owed	$0.00		$0.00		$65.70	

Payment Information for Current And Prior Year

Date	Half	Prior	1st Half	2nd Half	Surplus
2/5/2025	1 - 2024	$0.00	$33,963.88	$0.00	$0.00
6/17/2024	2 - 2023	$0.00	$0.00	$33,878.15	$0.00
2/5/2024	1 - 2023	$0.00	$33,878.15	$0.00	$0.00
6/15/2023	2 - 2022	$0.00	$0.00	$36,980.96	$0.00
1/30/2023	1 - 2022	$0.00	$36,980.96	$0.00	$0.00
6/17/2022	2 - 2021	$0.00	$0.00	$36,645.15	$0.00
1/28/2022	1 - 2021	$0.00	$36,645.15	$0.00	$0.00
6/21/2021	2 - 2020	$0.00	$0.00	$38,803.87	$0.00
2/5/2021	1 - 2020	$0.00	$38,803.87	$0.00	$0.00
7/17/2020	2 - 2019	$0.00	$0.00	$39,768.28	$0.00
1/31/2020	1 - 2019	$0.00	$39,768.28	$0.00	$0.00

Information believed accurate but not guaranteed. Treasurer disclaims liability for any errors or omissions

Contact the County Treasurer with your tax bill questions at county.treasurer@hamilton-co.org or 513-946-4800

Current Year
2024 Payable 2025
Prior Year
2023 Payable 2024

Tax Distribution Information

Market Value		Assessed Value (35%)		Tax Rate Information	
Land	192,920	Land	67,520	Full Tax Rate (mills)	108.870000
Building	2,201,690	Building	770,590	Reduction Factor	0.256855
Total	**2,394,610**	**Total**	**838,110**	Effective Tax Rate (mills)	80.906198
				Non Business Credit	0.087124
				Owner Occupancy Credit	0.021781

Tax Calculations

Gross Real Estate Tax	$91,245.04
- Reduction Amount	$23,436.74
- Non Business Credit	$0.00
- Owner Occupancy Credit	$0.00
- Homestead	$0.00
Half Year Real Taxes	$33,904.15
- Sales Tax Credit	$0.00
+ Current Assessment	$59.73
+ Delinquent Assessment	$0.00
+ Delinquent Real Estate	$0.00
Semi Annual Net	$33,963.88

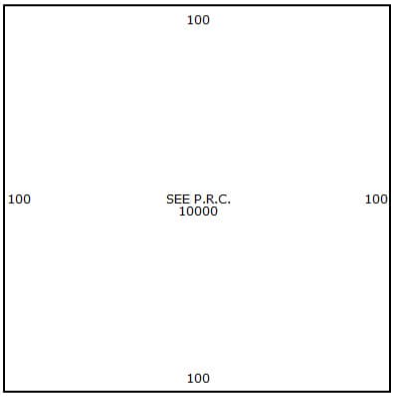
Half Year Tax Distributions

School District	$20,398.52
Township	$0.00
City/Village	$5,121.26
Joint Vocational School	$0.00
County General Fund	$947.05
Public Library	$906.89
Family Service/Treatment	$117.20
HLTH/Hospital Care-Indigent	$938.18
Mental Health Levy	$946.45
Developmental Disabilities	$1,423.63
Park District	$716.21
Crime Information Center	$104.37
Children Services	$1,587.08
Senior Services	$542.38
Zoological Park	$154.93

This shows the most recent tax bill calculation which normally occurs in early December and May. However, adjustments or corrections may have been applied to the tax bill after the initial tax calculation. Go to the Payment Detail tab to view any corrections or adjustments occurring after the initial tax calculation.

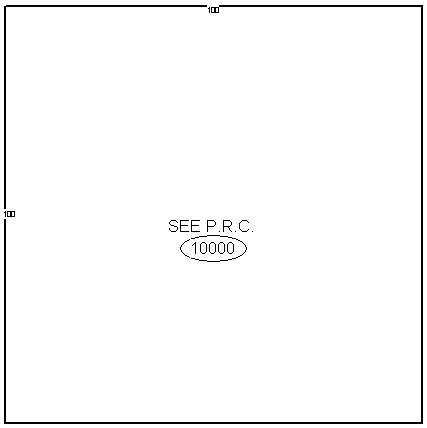
Parcel Photo

Current Parcel Sketch



Sketch by Apex Medina™

Legacy Parcel Sketch



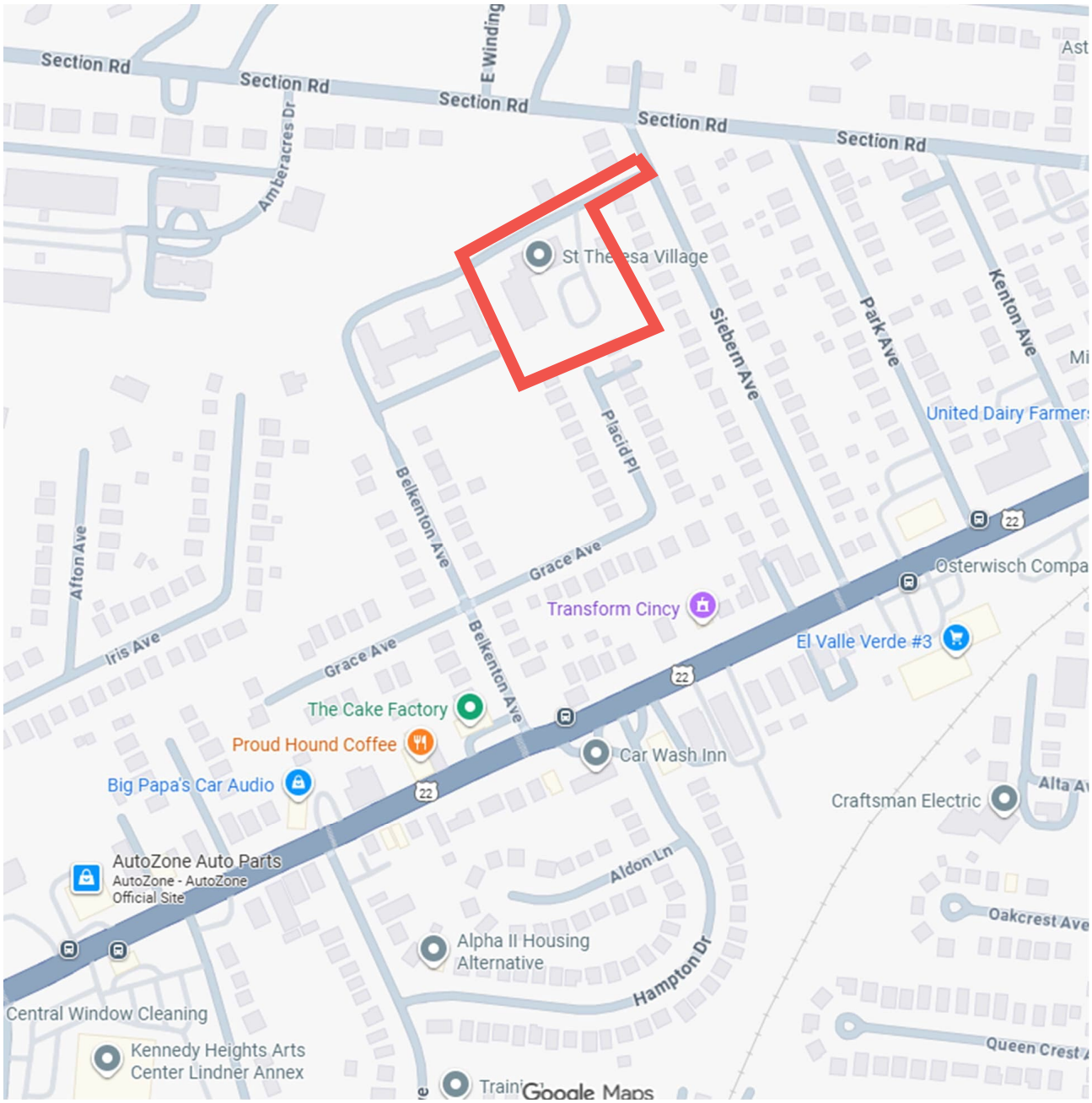
Special Assessments

Project	Ord/Res	Description	Certified	End Year	Payoff Amount
13-999		STORM WATER	11/7/2024	2099	$65.70

Related Names

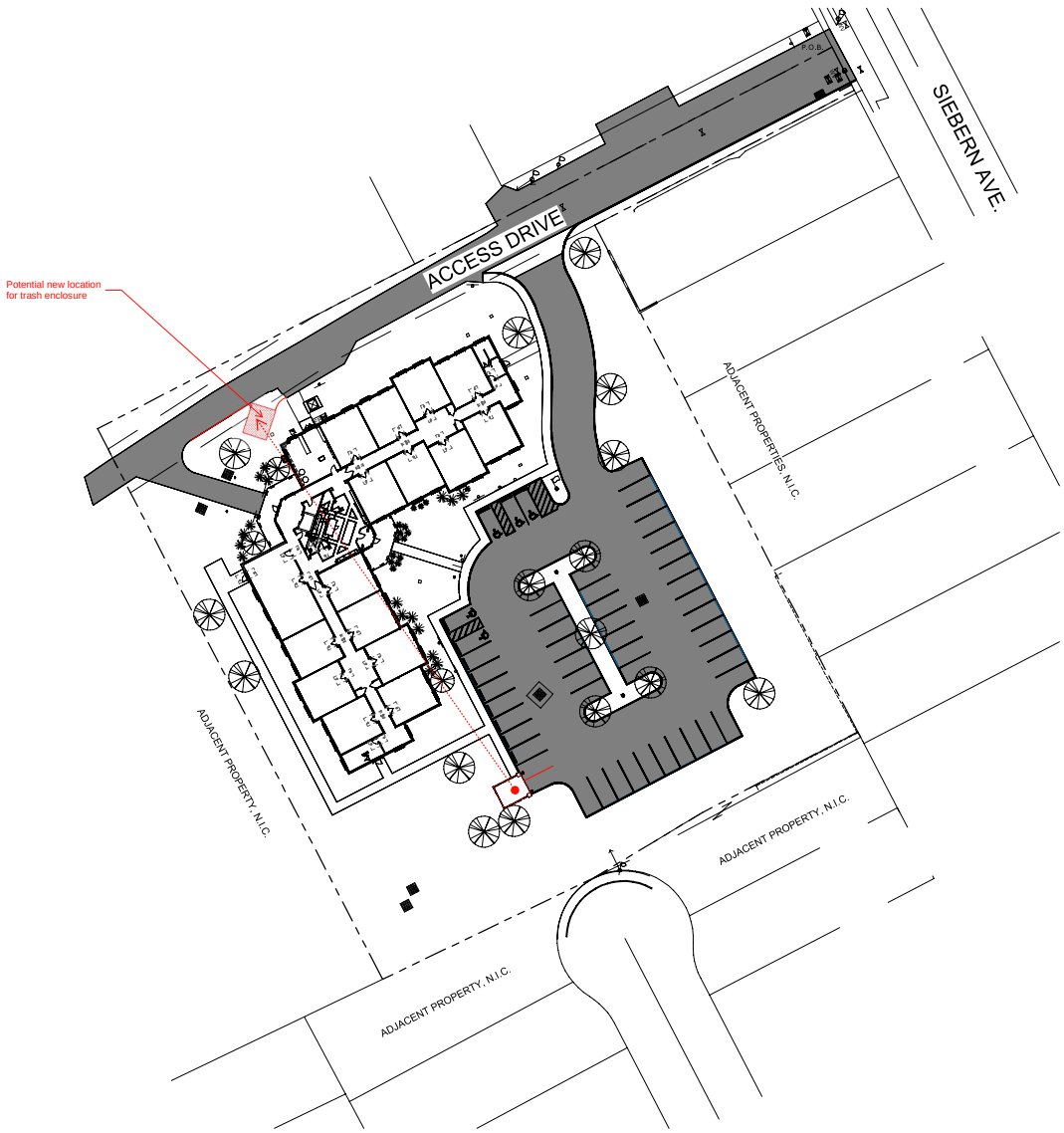
Name	Relationship	Status
ST THERESA VILLAGE INC	Parcel Owner	Current
ST THERESA VILLAGE	Mail Name	Current

Appendix A Site Topographic Map	↑ **N**	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio *Topographic Quadrangle:* *East Cincinnati, Ohio 2023*	**DOMINION DUE DILIGENCE GROUP**



Appendix A Site Locator Map	↑ **N**	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio	**DOMINION DUE DILIGENCE GROUP**

Appendix A Site Plan	↑ **N**	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio	**DOMINION DUE DILIGENCE GROUP**



architectural site plan

1" = 30'-0"

planting schedule				
TAG	BOTANICAL NAME	COMMON NAME	COUNT	REMARKS
		<varies>	51	
			51	

general zoning information:

ADDRESS: tbd
PARCEL NUMBER: tbd
EXISTING ZONING CLASSIFICATION/DISTRICT: tbd
PROPOSED ZONING CLASSIFICATION/DISTRICT: tbd
EXISTING HEIGHT DISTRICT: tbd
PROPOSED HEIGHT DISTRICT: tbd
COMMERCIAL OVERLAY: tbd
TOTAL SITE AREA: tbd
FLOOD INSURANCE RATE MAP NUMBER: tbd
MOST RECENT EFFECTIVE DATE OF FIRM: tbd
BASE FLOOD ELEVATION: tbd

general project information:

EXISTING ZONING MAXIMUM BUILDING HEIGHT:
PROPOSED ZONING MAXIMUM BUILDING HEIGHT:
PROPOSED BUILDING HEIGHT:
BUILDING USE:
BUILDING AREA:
NUMBER OF DWELLING UNITS (RESIDENTIAL ONLY):
PROPOSED REFUSE SERVICE (RESIDENTIAL ONLY):
PROPOSED REFUSE CAPACITY C.Y. (RESIDENTIAL ONLY):
PARKING SPACES:

site data table:

TOTAL SITE AREA: tbd
TOTAL DISTURBED AREA: tbd
PRE-DEVELOPED IMPERVIOUS: tbd
POST-DEVELOPED IMPERVIOUS: tbd

parking calculation:

REQUIRED RESIDENTIAL PARKING (1.5 PER UNIT): tbd
PROPOSED RESIDENTIAL PARKING: tbd
REQUIRED COMMERCIAL (RETAIL) PARKING (1 PER 250 SF *.5): tbd
PROPOSED COMMERCIAL PARKING: tbd
REQUIRED ADA PARKING (VAN/TOTAL): tbd
PROPOSED ADA PARKING (VAN/TOTAL): tbd

bicycle parking calculation:

BICYCLE PARKING REQUIRED
(1 SPACE PER 20 VEHICULAR SPACES / MAX. 20): tbd
PROPOSED BICYCLE PARKING: tbd

shade tree calculation:

DWELLING UNIT SHADE TREES REQUIREMENTS
(1 PER 10 DWELLING UNITS): tbd
DWELLING UNIT SHADE TREES PROVIDED: tbd

ST. THERESA VILLAGE

6783 SIEBERN AVE.
CINCINNATI, OH 45236

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NOTE:
1. ALL BIDDERS SHALL VISIT THE SITE AND BECOME FAMILIAR W/ THE EXISTING CONDITIONS AND REQUIREMENTS OF THE PROJECT AND SHALL NOTIFY THE ARCHITECT OF ANY ERRORS AND OMISSIONS SUBSEQUENTLY DISCOVERED IN THE CONTRACT DOCUMENTS.
2. THE CONTRACT DOCUMENTS ARE COMPRISED OF THE DRAWINGS AND THE PROJECT MANUAL. IN THEIR ENTIRETY, THE INFORMATION IN THESE DOCUMENTS IS DEPENDENT UPON AND COMPLEMENTARY OF EACH OTHER. SEPARATION OF THE CONTRACT DOCUMENTS SHALL NOT BE PERMITTED IF THE CONTRACTOR CHOOSES TO SEPARATE THE DOCUMENTS, THEY DO SO AT THEIR OWN RISK AND EXPENSE.
3. ADDITIONALLY, SEE GENERAL INFORMATION ON G0' SHEETS.
4. THE CLIENT ACKNOWLEDGES THE CONSULTANTS (ARCHITECT) DRAWINGS AND SPECIFICATION, INCLUDING ALL DOCUMENTS ON ELECTRONIC MEDIA AS INSTRUMENTS OF THE CONSULTANTS (ARCHITECT) PROFESSIONAL SERVICE. THE CLIENT SHALL NOT REUSE OR MAKE OR PERMIT TO BE MADE ANY MODIFICATION TO THE DRAWINGS AND SPECIFICATIONS WITHOUT THE PRIOR WRITTEN AUTHORIZATION OF THE CONSULTANT (ARCHITECT). THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST THE CONSULTANT (ARCHITECT) ARISING FROM ANY UNAUTHORIZED TRANSFER, REUSE OR MODIFICATION OF THE DRAWINGS AND SPECIFICATIONS.
5. ARCHITECT CANNOT WARRANT THE ACCURACY OF DATA CONTAINED HEREIN. ANY USE OR REUSE OF ORIGINAL OR ALTERED CADD DESIGN MATERIALS BY THE USER OR OTHER PARTIES WITHOUT THE REVIEW AND WRITTEN APPROVAL OF THE ARCHITECT SHALL BE AT THE SOLE RISK OF THE USER. FURTHERMORE, USER AGREES TO DEFEND, INDEMNIFY, AND HOLD ARCHITECT HARMLESS FROM ALL CLAIMS, INJURIES, DAMAGES, LOSSES, EXPENSES, AND ATTORNEY'S FEES ARISING OUT OF THE MODIFICATION OR REUSE OF THESE MATERIALS.
6. THESE DRAWINGS AS PART OF THE CONTRACT DOCUMENTS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO DEFINE EXACT QUANTITIES, LOCATIONS OR CONFIRM REQUIREMENTS. THE DRAWINGS SHALL NOT BE SCALED. EXACT STATE AND LOCAL CODE REQUIREMENTS AND OTHER APPLICABLE CODE REQUIREMENTS SHALL BE VERIFIED BY AND ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ANY INFORMATION WHICH DIRECTLY CONFLICTS WITH ANY OF THESE CODES OR ANY DISCREPANCIES FOUND IN THE CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT ARCHITECT.

80% CD

PROJECT DATE: 10.31.2025
PROJECT #: 24126

#	Description	Date

NOT FOR CONSTRUCTION

SITE PLAN

AS101

BERARDI+
ARCHITECTURE | INTERIOR DESIGN | ENGINEERING
1398 GOODALE BOULEVARD, COLUMBUS, OHIO 43212
P 614.221.1110 berardipartners.com

9/16/2025 11:43:43 AM

C:\Users\egambina.BPI\Documents\24-24126_St.Theresa Village_Site_egambina.rvt

Appendix B:

Site Photographs

1: View of the subject property signage

2: View of the subject property

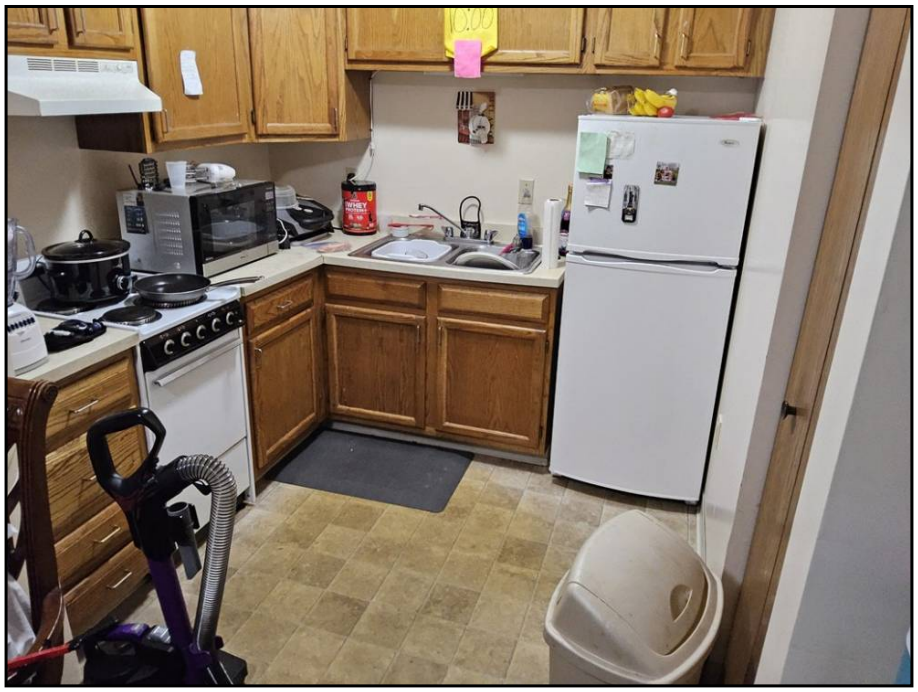
3: View of the subject property

4: View of the subject property

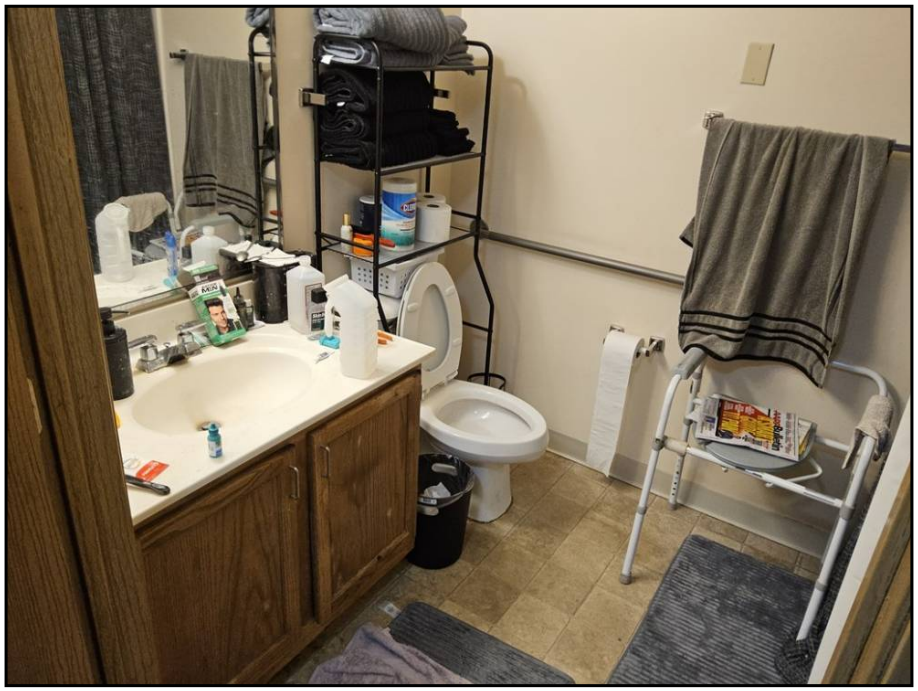
5: View of the subject property

6: View of the typical residential living room

7: View of the typical residential bedroom



8: View of the typical residential kitchen



9: View of the typical residential bathroom

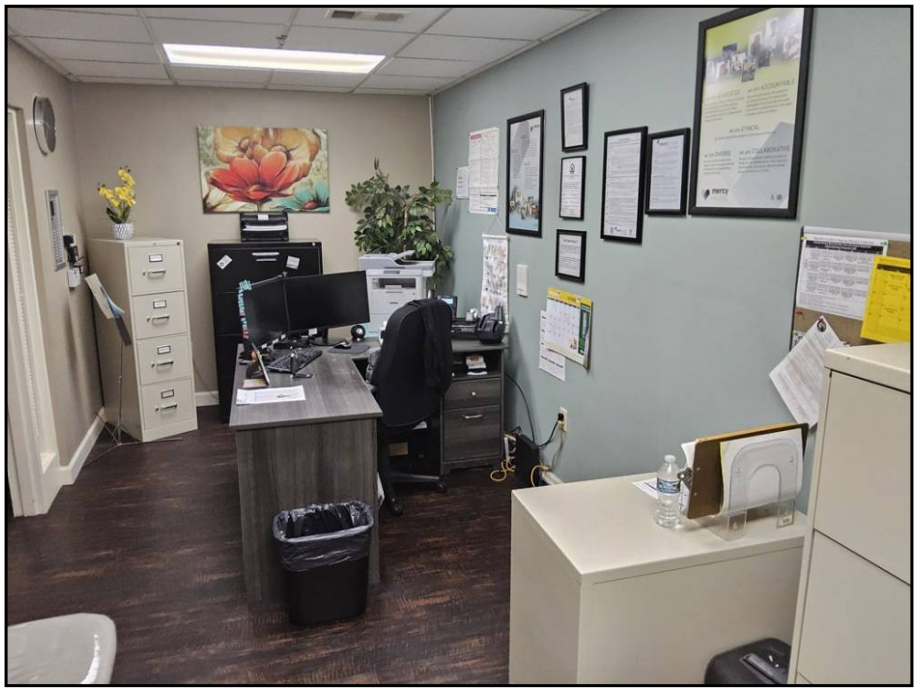
10: View of the laundry facilities

11: View of the community dining space

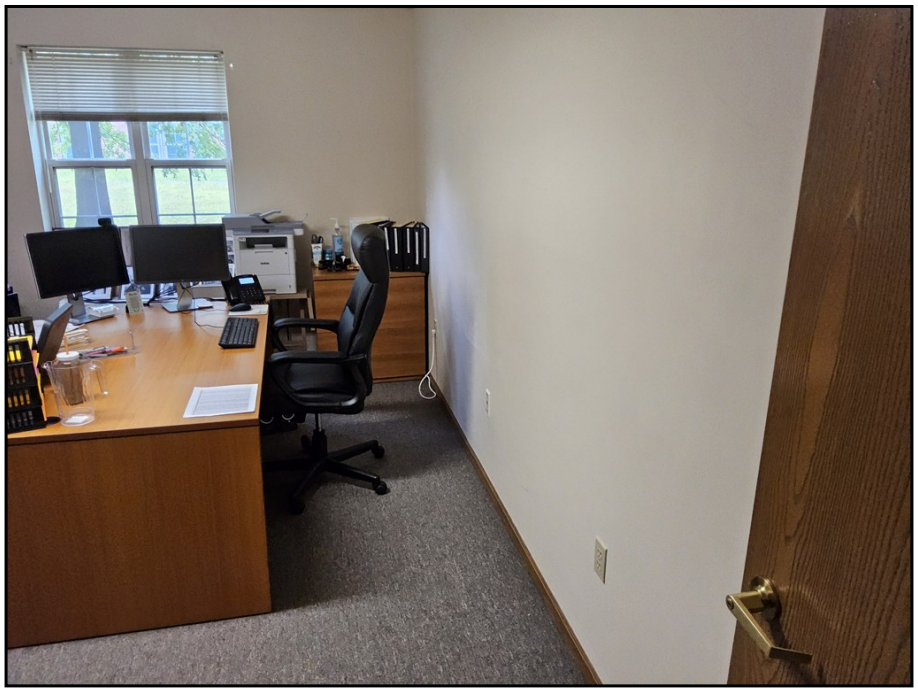
12: View of the community kitchen

13: View of the Wellness Center

14: View of the mail kiosk



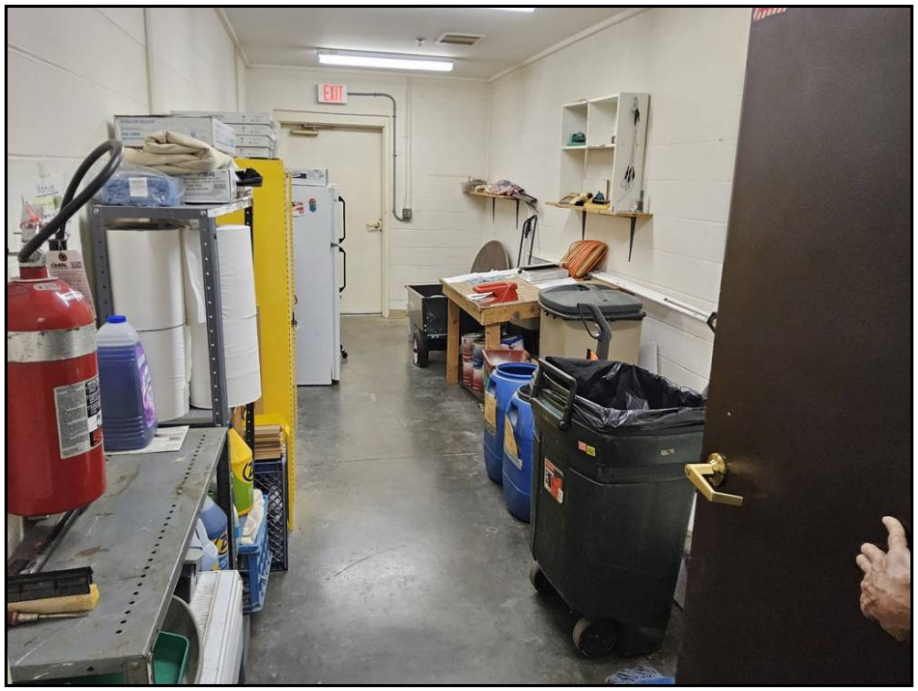
15: View of the leasing center



16: View of a typical office

17: View of a storage room

18: View of the elevator



19: View of a storage area

20: View of the maintenance area

21: View of a typical patio

22: View of the exterior shed

23: View of the pad-mounted transformer

24: View of the dumpster

25: View of the elevator equipment

26: View of the northern adjacent undeveloped wooded land

27: View of a typical northern adjacent multi-family residential

28: View of typical eastern adjacent single-family residential

29: View of a typical southern adjacent single-family residential

30: View of the western vacant, former St. Theresa Care Center

Appendix C:

Airport Hazards

Airport Hazards (CEST and EA)

General requirements	Legislation	Regulation
It is HUD's policy to apply standards to prevent incompatible development around civil airports and military airfields.		24 CFR Part 51 Subpart D
Reference		
https://www.hudexchange.info/environmental-review/airport-hazards		

1. To ensure compatible land use development, you must determine your site's proximity to civil and military airports. Is your project within 15,000 feet of a military airport or 2,500 feet of a civilian airport?

☑ No → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map showing that the site is not within the applicable distances to a military or civilian airport.*

☐ Yes → *Continue to Question 2.*

2. Is your project located within a Runway Potential Zone/Clear Zone (RPZ/CZ) or Accident Potential Zone (APZ)?

☐ Yes, project is in an APZ → *Continue to Question 3.*

☐ Yes, project is an RPZ/CZ → *Project cannot proceed at this location.*

☐ No, project is not within an APZ or RPZ/CZ

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map showing that the site is not within either zone.*

3. Is the project in conformance with DOD guidelines for APZ?

☐ Yes, project is consistent with DOD guidelines without further action.

Explain how you determined that the project is consistent:

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documentation supporting this determination.*

☐ No, the project cannot be brought into conformance with DOD guidelines and has not been approved.

→ Project cannot proceed at this location.

☐ Project is not consistent with DOD guidelines, but it has been approved by Certifying Officer or HUD Approving Official.

Explain approval process:

If mitigation measures have been or will be taken, explain in detail the proposed measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.
→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documentation supporting this determination.*

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

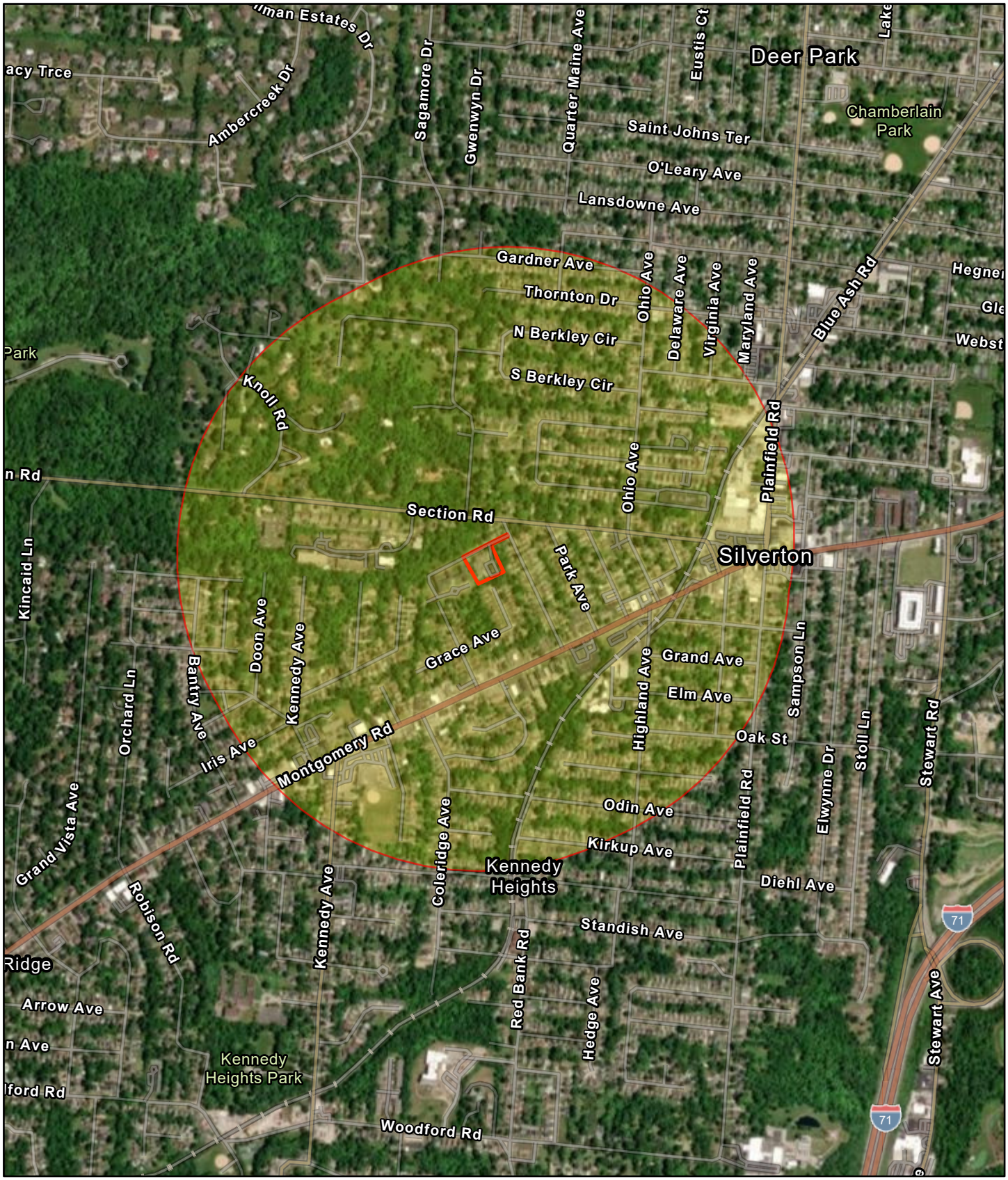
According to Federal Aviation Administration (FAA) information accessed at https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=showCircleSearchAirportsForm and http://nepassisttool.epa.gov/nepassist/entry.aspx, there are no military airports within 15,000 feet of the subject property or civil airport runways within 2,500 feet of the subject property. The proposed undertaking is in compliance with HUD's Airport Hazard regulations and no mitigation is warranted.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

Civilian Airports within 2500 Ft



September 24, 2025

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

Project Buffer

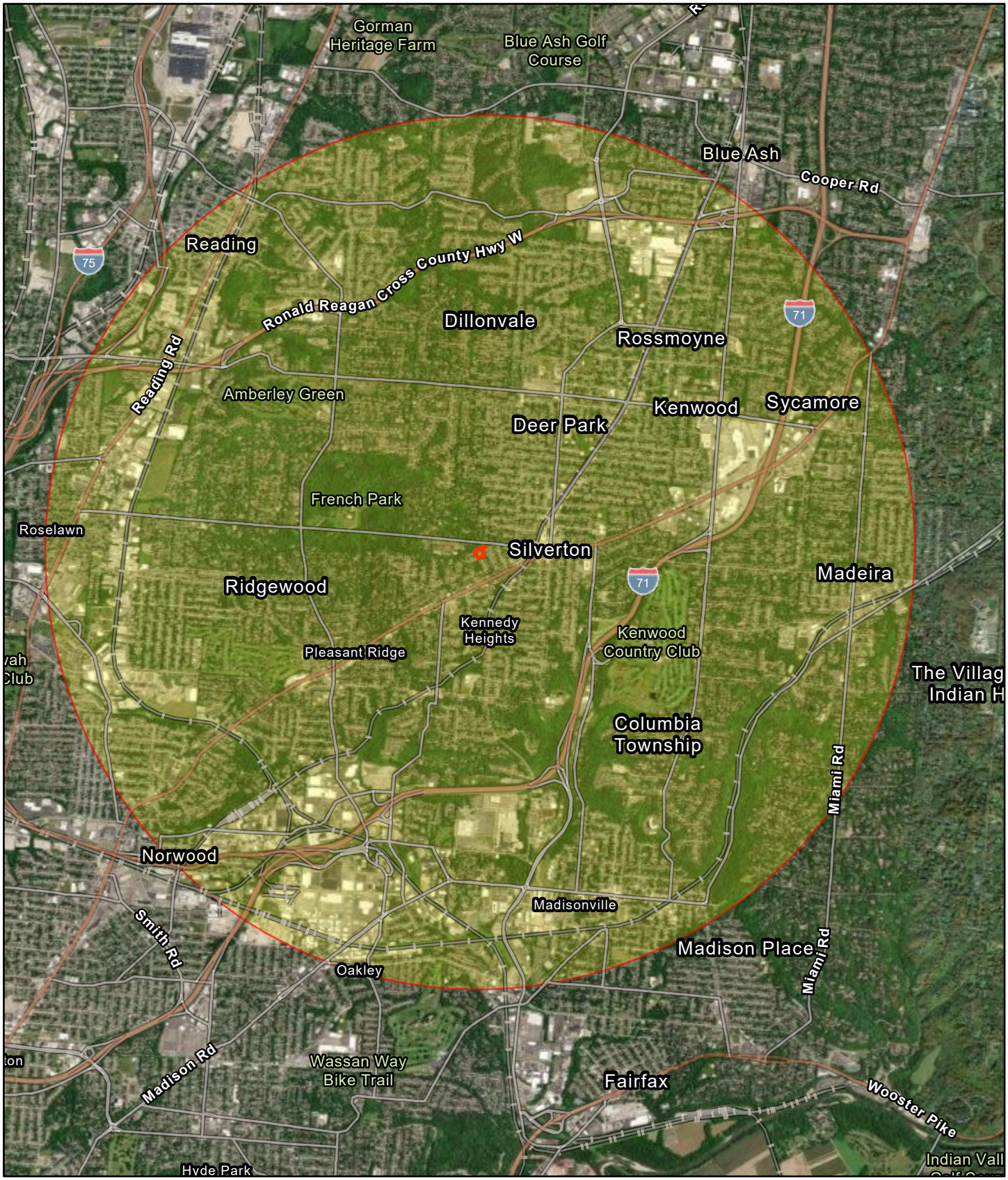
Project 1

Airport Points

Airport Polygons

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Maxar, EPA OEI

Military Airports within 15000 Ft



September 24, 2025

Project Buffer

Project 1

Airport Points

Airport Polygons

1:72,224

0 0.5 1 2 mi

0 0.75 1.5 3 km

Earthstar Geographics, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, EPA OEI

Appendix D:

Coastal Barrier Resources

Coastal Barrier Resources (CEST and EA)

General requirements	Legislation	Regulation
HUD financial assistance may not be used for most activities in units of the Coastal Barrier Resources System (CBRS). See 16 USC 3504 for limitations on federal expenditures affecting the CBRS.	Coastal Barrier Resources Act (CBRA) of 1982, as amended by the Coastal Barrier Improvement Act of 1990 (16 USC 3501)	
References		
https://www.hudexchange.info/environmental-review/coastal-barrier-resources		

Projects located in the following states must complete this form.

Alabama	Georgia	Massachusetts	New Jersey	Puerto Rico	Virgin Islands
Connecticut	Louisiana	Michigan	New York	Rhode Island	Virginia
Delaware	Maine	Minnesota	North Carolina	South Carolina	Wisconsin
Florida	Maryland	Mississippi	Ohio	Texas	

1. Is the project located in a CBRS Unit?

☑ No → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map showing that the site is not within a CBRS Unit.*

☐ Yes → *Continue to Question 2.*

> Federal assistance for most activities may not be used at this location. You must either choose an alternate site or cancel the project. In very rare cases, federal monies can be spent within CBRS units for certain exempted activities (e.g., a nature trail), after consultation with the Fish and Wildlife Service (FWS) (see 16 USC 3505 for exceptions to limitations on expenditures).

2. Indicate your selected course of action.

☐ After consultation with the FWS the project was given approval to continue

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map and documentation of a FWS approval.*

☐ Project was not given approval

Project cannot proceed at this location.

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

According to Coastal Barrier Resource Area information accessed at http://www.fws.gov/CBRA/Maps/index.html, the subject property is not located within a coastal barrier. Therefore, the project is in compliance with HUD's Coastal Barrier Resource Systems regulations and no mitigation is warranted.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

U.S. Fish and Wildlife Service

Coastal Barrier Resources System Mapper Documentation

CBRS Units

Otherwise Protected Area

System Unit

CBRS Buffer Zone

-84.40947, 39.193272

0 30 60 120 180 ft

1:2,257

The pin location displayed on the map is a point selected by the user. Failure of the user to ensure that the pin location displayed on this map correctly corresponds with the user supplied address/location description below may result in an invalid federal flood insurance policy. **The U.S. Fish and Wildlife Service (Service) has not validated the pin location with respect to the user supplied address/location description below. The Service recommends that all pin locations be verified by federal agencies prior to use of this map for the provision or denial of federal funding or financial assistance**. Please note that a structure bisected by the Coastal Barrier Resources System (CBRS) boundary (i.e., both "partially in" and "partially out") is within the CBRS and therefore affected by CBRA's restrictions on federal flood insurance. A pin placed on a bisected structure must be placed on the portion of the structure within the unit (including any attached features such as a deck or stairs).

User Name: Dana Pelkey
User Organization: Dominion Due Diligence
User Supplied Address/Location Description: 6783 Siebern Avenue Silverton, OH 45236
Pin Location: Outside CBRS
Pin Flood Insurance Prohibition Date: N/A
Pin System Unit Establishment Date: N/A

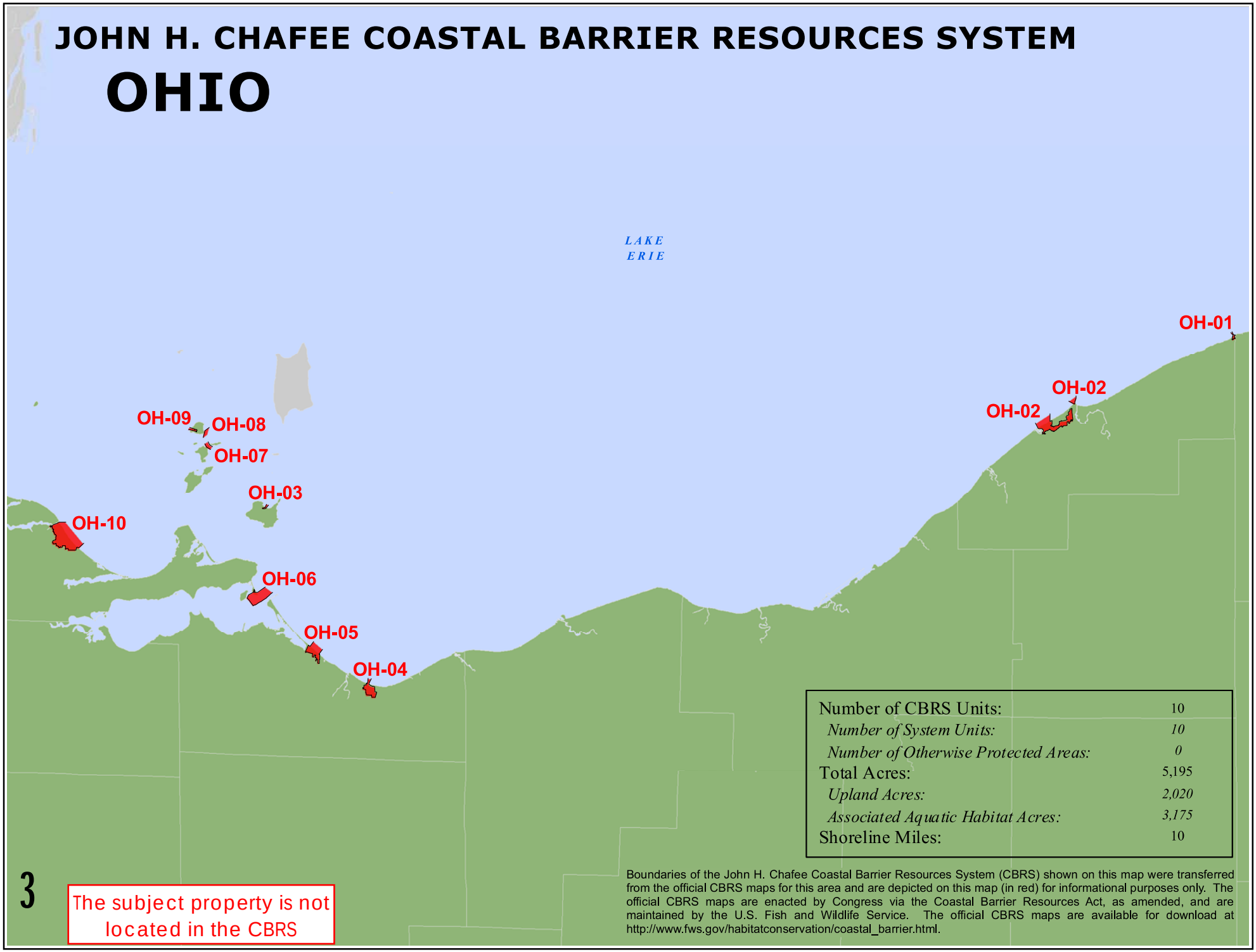
The user placed pin location is not within the CBRS. The official CBRS maps are accessible at https://www.fws.gov/library/collections/official-coastal-barrier-resources-system-maps.

The CBRS information is derived directly from the CBRS web service provided by the Service. This map was exported on 9/24/2025 and does not reflect changes or amendments subsequent to this date. The CBRS boundaries on this map may become superseded by new boundaries over time.

This map image may be void if one or more of the following map elements do not appear: basemap imagery, CBRS unit labels, prohibition date labels, legend, scale bar, map creation date. For additional information about flood insurance and the CBRS, visit: https://www.fws.gov/node/263838.

JOHN H. CHAFEE COASTAL BARRIER RESOURCES SYSTEM

OHIO



Number of CBRS Units:	10
Number of System Units:	*10*
Number of Otherwise Protected Areas:	*0*
Total Acres:	5,195
Upland Acres:	*2,020*
Associated Aquatic Habitat Acres:	*3,175*
Shoreline Miles:	10

3

The subject property is not located in the CBRS

Boundaries of the John H. Chafee Coastal Barrier Resources System (CBRS) shown on this map were transferred from the official CBRS maps for this area and are depicted on this map (in red) for informational purposes only. The official CBRS maps are enacted by Congress via the Coastal Barrier Resources Act, as amended, and are maintained by the U.S. Fish and Wildlife Service. The official CBRS maps are available for download at http://www.fws.gov/habitatconservation/coastal_barrier.html.

Appendix E:

Flood Insurance

Flood Insurance (CEST and EA)

General requirements	Legislation	Regulation
Certain types of federal financial assistance may not be used in floodplains unless the community participates in National Flood Insurance Program and flood insurance is both obtained and maintained	Flood Disaster Protection Act of 1973 as amended (42 USC 4001-4128)	24 CFR 50.4(b)(1) and 24 CFR 58.6(a) and (b); 24 CFR 55.1(b).
Reference		
https://www.hudexchange.info/environmental-review/flood-insurance		

1. Does this project involve financial assistance for construction, rehabilitation, or acquisition of a mobile home, building, or insurable personal property?

☐ No. This project does not require flood insurance or is excepted from flood insurance. → *Continue to the Worksheet Summary.*

☑ Yes → *Continue to Question 2.*

2. Provide a FEMA/FIRM map showing the site.

The Federal Emergency Management Agency (FEMA) designates floodplains. The FEMA Map Service Center provides this information in the form of FEMA Flood Insurance Rate Maps (FIRMs). For projects in areas not mapped by FEMA, use the best available information to determine floodplain information. Include documentation, including a discussion of why this is the best available information for the site. Provide FEMA/FIRM floodplain zone designation, panel number, and date within your documentation.

Is the structure, part of the structure, or insurable property located in a FEMA-designated Special Flood Hazard Area?

☑ No → Continue to the Worksheet Summary.

☐ Yes → Continue to Question 3.

3. Is the community participating in the National Flood Insurance Program or has less than one year passed since FEMA notification of Special Flood Hazards?

☐ Yes, the community is participating in the National Flood Insurance Program.

For loans, loan insurance or loan guarantees, flood insurance coverage must be continued for the term of the loan. For grants and other non-loan forms of financial assistance, flood insurance coverage must be continued for the life of the building irrespective of the transfer of ownership. The amount of coverage must equal the total project cost or the maximum coverage limit of the National Flood Insurance Program, whichever is less Provide a copy of the flood insurance policy declaration or a paid receipt for the current annual flood insurance premium and a copy of the application for flood insurance.

→ Continue to the Worksheet Summary.

☐ Yes, less than one year has passed since FEMA notification of Special Flood Hazards. If less than one year has passed since notification of Special Flood Hazards, no flood Insurance is required

→ Continue to the Worksheet Summary.

☐ No. The community is not participating, or its participation has been suspended.

Federal assistance may not be used at this location. Cancel the project at this location.

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

According to FEMA Flood Insurance Rate Map (FIRM) #39061C-0233E dated February 17, 2010, the subject property is located in Unshaded Zone X, designated as an area outside the 100 and 500-year flood zones and the flood potential for the subject property is minimal. According to the FEMA Flood Map Service Center accessed at https://msc.fema.gov/portal/home, there are no preliminary or pending FIRMs for the subject property. According to Ms. Alicia Silverio, Ohio Floodplain Manager (614-264-6750), the City of Silverton is not a participating community in the National Flood Insurance Program (NFIP). However, as no structures or insurable property are located within a Special Flood Hazard Area (100-year flood zone), flood insurance is not required under the NFIP.

Are formal compliance steps or mitigation required?

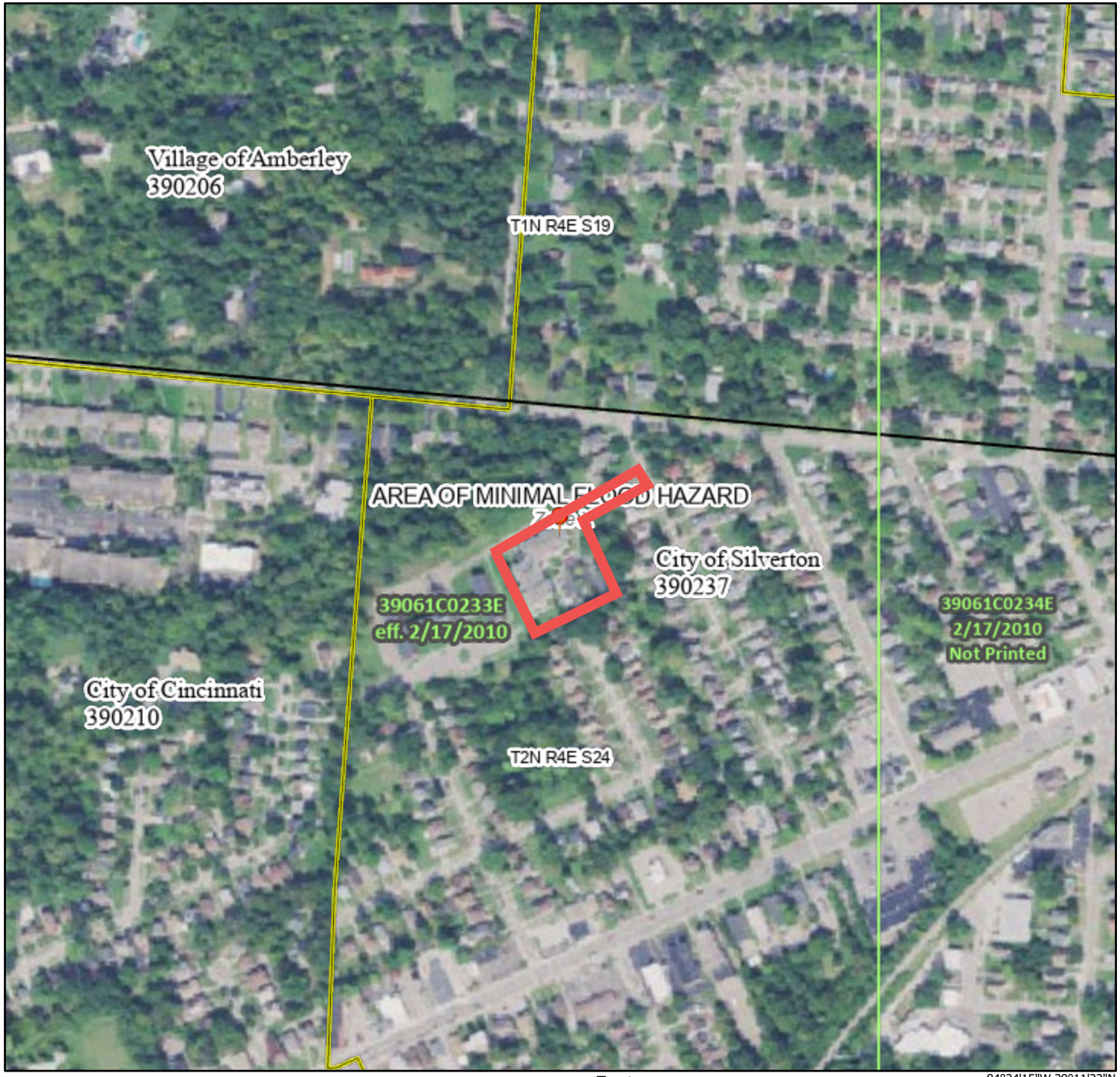
☐ Yes

☑ No

National Flood Hazard Layer FIRMette

FEMA

84°24'52"W 39°11'50"N



84°24'15"W 39°11'22"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/24/2025 at 7:15 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

The subject property firm number is not listed

"

FEMA (//www.fema.gov/)

Navigation

Search

MSC Home (/portal/)

MSC Search by Address (/portal/search)

MSC Search All Products (/portal/advanceSearch)

MSC Products and Tools (/portal/resources/productsandtools)

Hazus (/portal/resources/hazus)

LOMC Batch Files (/portal/resources/lomc)

Product Availability (/portal/productAvailability)

MSC Frequently Asked Questions (FAQs) (/portal/resources/faq)

MSC Email Subscriptions (/portal/subscriptionHome)

Contact MSC Help (/portal/resources/contact)

FEMA Flood Map Service Center: Search All Products

Choose one of the three search options below and optionally enter a posting date range.

Jurisdiction

State

-- Select --

Jurisdiction Name

Jurisdiction Name or FEMA ID

SILVERTON, CITY OF

(Ex. Fairfax County-wide or 51059C)

Product ID

Product ID

(Ex. Panel Number, LOMC Case Number)

Filter By Posting Date Range *(Optional)*

Search | Clear All Fields

Search Results for SILVERTON, CITY OF

Click subscribe to receive email notifications when products are updated.

Click to download a listing of all products.

If you are a person with a disability, are blind, or have low vision, and need assistance, please contact a map specialist (https://msc.fema.gov/portal/resources/contact).

Please Note: Searching All Products by county displays all products for all communities within the county. You can refine your search results by specifying your specific jurisdiction location using the drop-down menus above.

Expand All

Effective Products (9)

Preliminary Products (3)

Please note: Preliminary data are for review and guidance purposes only. By viewing preliminary data and maps, the user acknowledges that the information provided is preliminary and subject to change. Preliminary data, including new or revised FIRMs, FIS reports, and FIRM Databases, are not final and are presented on the MSC as the best information available at this time. Additionally, preliminary data cannot be used to rate flood insurance policies or enforce the Federal mandatory purchase requirement. FEMA will remove preliminary data once effective data are available.

Preliminary FIRM Panels (3) DL ALL

Please note: Searches often result in many map files listed under a given section. You can determine the Product ID for the individual map panel needed by looking at the Map Index file. The index map files have "IND" within the Product ID and appear at the start of the list. These index files show an overview of a jurisdiction and how it is subdivided into map panels with the Product ID for each panel shown.

Show 100 **entries**

Showing 1 to 3 of 3 entries

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Product ID	Issue Date	Size	Download
39061CIND1B	03/05/2021	1 MB	DL (/portal/downloadProduct?productTypeID=PRELIM_PRODUCT&productSubTypeID=PRELIM_FIRM_INDEX&p
39061CIND1G	02/03/2023	2 MB	DL (/portal/downloadProduct?productTypeID=PRELIM_PRODUCT&productSubTypeID=PRELIM_FIRM_INDEX&p
39061CIND2B	03/05/2021	1 MB	DL (/portal/downloadProduct?productTypeID=PRELIM_PRODUCT&productSubTypeID=PRELIM_FIRM_INDEX&p

Preliminary FIS Reports (0)

Preliminary FIRM Database (0)

Pending Product (0)

Historic Products (19)

Flood Risk Products (0)

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Community Overview

Community:	SILVERTON, CITY OF	**State:**	OHIO
County:	HAMILTON COUNTY	**CID:**	390237

Program:		**Emergency Entry:**		**Regular Entry:**	
Status:	NOT PARTICIPATING			**Status Effective:**	03/25/1999
Current Map:	06/07/2023	**Study Underway:**	YES	**Level of Regs:**	
FIRM Status:	ALL ZONE C&X PUBLISHED FIRM			**Initial FIRM:**	02/17/2010
FHBM Status:	NEVER MAPPED			**Initial FHBM:**	

Probation Status:	
Probation Effective:	**Probation Ended:**
Suspension Effective:	**Reinstated Effective:**
Withdrawal Effective:	**Reinstated Effective:**

CRS Class / Discount:		
Effective Date:		
CAV Date:	**Workshop Date:**	12/31/2020
CAC Date:	**GTA Date:**	06/17/2024
☐ **Tribal Community**	**Community Website:**	
☐ **Community Violations Tracker**		☐ **HMGP Projects**
☐ **ICC Claims**		☐ **FMA Projects**

Policies in Force:
Insurance in Force:
No. of Paid Losses:
Total Losses Paid:
Sub. Damage Claims Since 1978:
Data Sharing Agreement Type:
Data Sharing Agreement Date:

Lexi Brass

From:	Sammi Alfonso
Sent:	Tuesday, October 7, 2025 3:45 PM
To:	Lexi Brass
Subject:	FW: Silverton, OH
Attachments:	CIS_ Community Overview_Silverton_OH.pdf

Here you go!

Sammi Alfonso, EP
(she, her, hers)
NEPA Compliance Manager

People, Innovation, Passion, Excellence

From: Alicia.Silverio@dnr.ohio.gov <Alicia.Silverio@dnr.ohio.gov>
Sent: Tuesday, October 7, 2025 1:41 PM
To: Sammi Alfonso <s.alfonso@d3g.com>
Subject: Silverton, OH

Caution: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

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Community Overview

Community:	SILVERTON, CITY OF	State:	OHIO
County:	HAMILTON COUNTY	CID:	390237

Program:		Emergency Entry:		Regular Entry:	
Status:	NOT PARTICIPATING			Status Effective:	0
Current Map:	06/07/2023	Study Underway:	YES	Level of Regs:	
FIRM Status:	ALL ZONE C&X PUBLISHED FIRM			Initial FIRM:	0
FHBM Status:	NEVER MAPPED			Initial FHBM:	

Probation Status:	
Probation Effective:	Probation Ended:
Suspension Effective:	Reinstated Effective:
Withdrawal Effective:	Reinstated Effective:

CRS Class / Discount:			Policies in Force:
Effective Date:			Insurance in Force:
CAV Date:	Workshop Date:	12/31/2020	No. of Paid Losses:
CAC Date:	GTA Date:	06/17/2024	Total Losses Paid:
	Community Website:		Sub. Damage Claims Since 1978:
Tribal Community			Data Sharing Agreement Type:
Community Violations Tracker		HMGP Projects	Data Sharing Agreement Date:
ICC Claims		FMA Projects	

Alicia Silverio, CFM
Program Manager/NFIP State Coordinator
Floodplain Management Program/Division of Water Resources
alicia.silverio@dnr.ohio.gov
614.265.1006
Ohio Department of Natural Resources
2045 Morse Road, Building B-3
Columbus, Ohio 43229
ohiodnr.gov

Ohio Department of Natural Resources

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Appendix F:

Air Quality

Air Quality (CEST and EA)

General requirements	Legislation	Regulation
The Clean Air Act is administered by the U.S. Environmental Protection Agency (EPA), which sets national standards on ambient pollutants. In addition, the Clean Air Act is administered by States, which must develop State Implementation Plans (SIPs) to regulate their state air quality. Projects funded by HUD must demonstrate that they conform to the appropriate SIP.	Clean Air Act (42 USC 7401 et seq.) as amended particularly Section 176(c) and (d) (42 USC 7506(c) and (d))	40 CFR Parts 6, 51 and 93
Reference		
https://www.hudexchange.info/environmental-review/air-quality		

Scope of Work

1. Does your project include new construction or conversion of land use facilitating the development of public, commercial, or industrial facilities OR five or more dwelling units?

☐ Yes
→ *Continue to Question 2.*

☑ No
Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination.

Air Quality Attainment Status of Project's County or Air Quality Management District

2. Is your project's air quality management district or county in non-attainment or maintenance status for any criteria pollutants?
Follow the link below to determine compliance status of project county or air quality management district:
http://www.epa.gov/oaqps001/greenbk/

☐ No, project's county or air quality management district is in attainment status for all criteria pollutants
→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination.*

☐ Yes, project's management district or county is in non-attainment or maintenance status for one or more criteria pollutants.

Describe the findings:

→ *Continue to Question 3.*

3. Determine the <u>estimated emissions levels of your project for each of those criteria pollutants</u> that are in non-attainment or maintenance status on your project area. Will your project exceed any of the de minimis or threshold emissions levels of non-attainment and maintenance level pollutants or exceed the screening levels established by the state or air quality management district?

☐ No, the project will not exceed de minimis or threshold emissions levels or screening levels
→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Explain how you determined that the project would not exceed de minimis or threshold emissions.*

☐ Yes, the project exceeds de minimis emissions levels or screening levels.
→ *Continue to Question 4. Explain how you determined that the project would not exceed de minimis or threshold emissions in the Worksheet Summary.*

4. For the project to be brought into compliance with this section, all adverse impacts must be mitigated. Explain in detail the exact measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

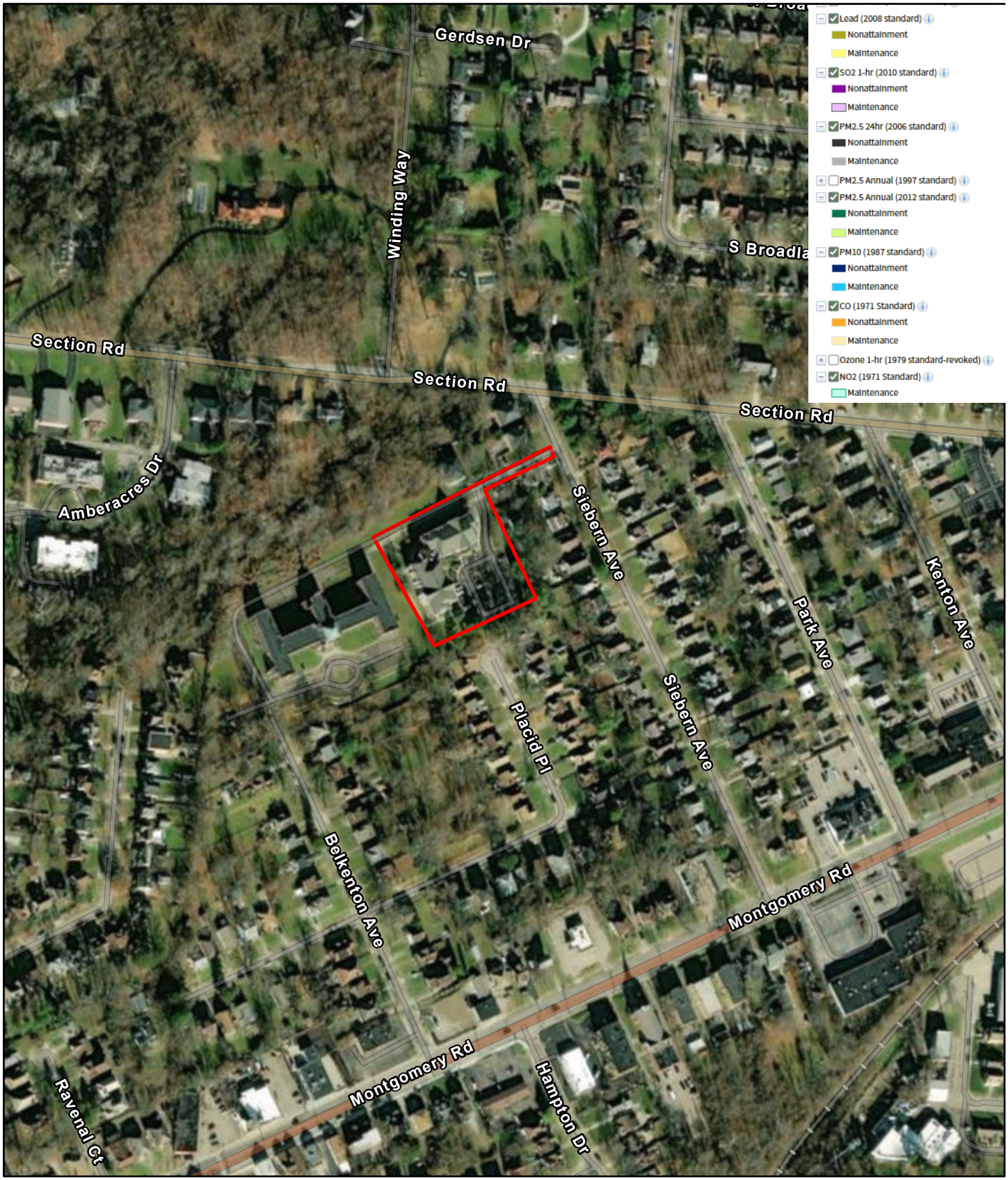
According to the U.S. Environmental Protection Agency (EPA) Green Book County-Level Multi-Pollutant Information accessed at http://www.epa.gov/airquality/greenbk/ancl.html and the EPA NEPAssist tool accessed at http://nepassisttool.epa.gov/nepassist/entry.aspx, the subject property is located within a Maintenance Area for 8-Hour Ozone (2015 standard). However, The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex and does not include new construction or conversion of land use facilitating the development of public, commercial, or industrial facilities or five or more dwelling units; therefore, the project is in compliance with HUD's Air Quality regulations and no mitigation is required.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

Non-attainment Areas and Criteria Pollutant



September 29, 2025

Project 1

1:4,514

0 0.03 0.06 0.11 mi

0 0.05 0.1 0.19 km

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Maxar, U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning and Standards (OAQPS)

Non-attainment Areas and Criteria Pollutant - Ozone 8-hr (2015 Standard)

September 29, 2025

1:4,514

0 0.03 0.06 0.11 mi

0 0.05 0.1 0.19 km

Project 1

Ozone 8-hr (2015 Standard)

Maintenance

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Maxar, U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning and Standards (OAQPS)

logo

Ohio Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants

Data is current as of August 31, 2025

Listed by County, NAAQS, Area. The 8-hour Ozone (1997) standard was revoked on April 6, 2015 and the 1-hour Ozone (1979) standard was revoked on June 15, 2005.

* The 1997 Primary Annual PM-2.5 NAAQS (level of 15 μg/m^3) is revoked in attainment and maintenance areas for that NAAQS. For additional information see the PM-2.5 NAAQS SIP Requirements Final Rule, effective October 24, 2016. (81 FR 58009)

Change the State:
OHIO GO

Important Notes

Download National Dataset: dbf | xls | Data dictionary (PDF)

County	NAAQS	Area Name	Nonattainment in Year	Redesignation to Maintenance	Classification	Whole or/ Part County	Population (2010)	State/ County FIPS Codes
OHIO								
Adams County	PM-2.5 (1997)-NAAQS revoked	Huntington-Ashland, WV-KY-OH	05060708091011	12/31/2012 *	Former Subpart 1	Part	3,355	39/001
Allen County	8-Hour Ozone (1997)-NAAQS revoked	Lima, OH	040506	06/15/2007	Former Subpart 1	Whole	106,331	39/003
Ashtabula County	1-Hour Ozone (1979)-NAAQS revoked	Cleveland-Akron-Lorain, OH	92939495	05/07/1996	Moderate	Whole	101,497	39/007
Ashtabula County	8-Hour Ozone (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0405060708	09/15/2009	Moderate	Whole	101,497	39/007
Ashtabula County	8-Hour Ozone (2008)	Cleveland-Akron-Lorain, OH	1213141516	01/06/2017	Marginal	Whole	101,497	39/007
Ashtabula County	PM-2.5 (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0506070809101112	09/18/2013 *	Former Subpart 1	Part	22,514	39/007
Belmont County	8-Hour Ozone (1997)-NAAQS revoked	Wheeling, WV-OH	040506	06/15/2007	Former Subpart 1	Whole	70,400	39/013
Belmont County	PM-2.5 (1997)-NAAQS revoked	Wheeling, WV-OH	0506070809101112	08/29/2013 *	Former Subpart 1	Whole	70,400	39/013
Butler County	1-Hour Ozone (1979)-NAAQS revoked	Cincinnati-Hamilton, OH-KY	929394959697898990001020304	06/14/2005	Moderate	Whole	368,130	39/017
Butler County	8-Hour Ozone (1997)-NAAQS revoked	Cincinnati-Hamilton, OH-KY-IN	040506070809	05/11/2010	Former Subpart 1	Whole	368,130	39/017
Butler County	8-Hour Ozone (2008)	Cincinnati, OH-KY-IN	12131415	12/16/2016	Marginal	Whole	368,130	39/017
Butler County	8-Hour Ozone (2015)	Cincinnati, OH-KY	18192021	06/09/2022	Marginal	Whole	368,130	39/017
Butler County	PM-2.5 (1997)-NAAQS revoked	Cincinnati-Hamilton, OH-KY-IN	0506070809101112131415 16	04/07/2017 *	Former Subpart 1	Whole	368,130	39/017
Clark County	1-Hour Ozone (1979)-NAAQS revoked	Dayton-Springfield, OH	929394	07/05/1995	Moderate	Whole	138,333	39/023
Clark County	8-Hour Ozone (1997)-NAAQS revoked	Dayton-Springfield, OH	040506	08/13/2007	Former Subpart 1	Whole	138,333	39/023
Clark County	PM-2.5 (1997)-NAAQS revoked	Dayton-Springfield, OH	0506070809101112	09/26/2013 *	Former Subpart 1	Whole	138,333	39/023
Clermont County	1-Hour Ozone (1979)-NAAQS revoked	Cincinnati-Hamilton, OH-KY	929394959697898990001020304	06/14/2005	Moderate	Whole	197,363	39/025
Clermont County	8-Hour Ozone (1997)-NAAQS revoked	Cincinnati-Hamilton, OH-KY-IN	040506070809	05/11/2010	Former Subpart 1	Whole	197,363	39/025
Clermont County	8-Hour Ozone (2008)	Cincinnati, OH-KY-IN	12131415	12/16/2016	Marginal	Whole	197,363	39/025
Clermont County	8-Hour Ozone (2015)	Cincinnati, OH-KY	18192021	06/09/2022	Marginal	Whole	197,363	39/025
Clermont County	PM-2.5 (1997)-NAAQS revoked	Cincinnati-Hamilton, OH-KY-IN	0506070809101112131415 16	04/07/2017 *	Former Subpart 1	Whole	197,363	39/025
Clermont County	Sulfur Dioxide (2010)	Campbell-Clermont Counties, KY-OH	131415	11/21/2016		Part	14,349	39/025
Clinton County	1-Hour Ozone (1979)-NAAQS revoked	Clinton County, OH	92939495	03/21/1996	Section 185A	Whole	42,040	39/027
Clinton County	8-Hour Ozone (1997)-NAAQS revoked	Cincinnati-Hamilton, OH-KY-IN	040506070809	05/11/2010	Former Subpart 1	Whole	42,040	39/027
Clinton County	8-Hour Ozone (2008)	Cincinnati, OH-KY-IN	12131415	12/16/2016	Marginal	Whole	42,040	39/027
Columbiana County	1-Hour Ozone (1979)-NAAQS revoked	Columbiana County, OH	929394	03/10/1995	Incomplete Data	Whole	107,841	39/029
Columbiana County	8-Hour Ozone (1997)-NAAQS revoked	Youngstown-Warren-Sharon, OH-PA	040506	06/12/2007	Former Subpart 1	Whole	107,841	39/029
Coshocton County	PM-2.5 (1997)-NAAQS revoked	Columbus, OH	0506070809101112	11/07/2013 *	Former Subpart 1	Part	1,535	39/031
Coshocton County	Sulfur Dioxide (1971)	Coshocton County; Franklin Township, OH	9293949596979899	07/05/2000		Part	1,229	39/031
Cuyahoga County	1-Hour Ozone (1979)-NAAQS revoked	Cleveland-Akron-Lorain, OH	92939495	05/07/1996	Moderate	Whole	1,280,122	39/035
Cuyahoga County	8-Hour Ozone (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0405060708	09/15/2009	Moderate	Whole	1,280,122	39/035
Cuyahoga County	8-Hour Ozone (2008)	Cleveland-Akron-Lorain, OH	1213141516	01/06/2017	Marginal	Whole	1,280,122	39/035
Cuyahoga County	8-Hour Ozone (2015)	Cleveland, OH	1819202122232425	/ /	Serious	Whole	1,280,122	39/035
Cuyahoga County	Carbon Monoxide (1971)	Cleveland, OH	9293	03/07/1994	Moderate <= 12.7ppm	Whole	1,280,122	39/035
Cuyahoga County	Lead (2008)	Cleveland, OH	10111213141516	07/31/2017		Part	7,816	39/035
Cuyahoga County	PM-10 (1987)	Cuyahoga County, OH	929394959697989900	01/10/2001	Moderate	Whole	1,280,122	39/035
Cuyahoga County	PM-2.5 (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0506070809101112	09/18/2013 *	Former Subpart 1	Whole	1,280,122	39/035
Cuyahoga County	PM-2.5 (2006)	Cleveland-Akron-Lorain, OH	09101112	09/18/2013	Former Subpart 1	Whole	1,280,122	39/035

County	NAAQS	Area Name	Nonattainment in Year	Redesignation to Maintenance	Classification	Whole or/ Part County	Population (2010)	State/ County FIPS Codes
Cuyahoga County	PM-2.5 (2012)	Cleveland, OH	15161718	04/12/2019	Moderate	Whole	1,280,122	39/035
Cuyahoga County	Sulfur Dioxide (1971)	Cuyahoga County, OH	92939495969798990001020304	02/28/2005		Part	996,159	39/035
Delaware County	1-Hour Ozone (1979)-NAAQS revoked	Columbus, OH	92939495	04/01/1996	Marginal	Whole	174,214	39/041
Delaware County	8-Hour Ozone (1997)-NAAQS revoked	Columbus, OH	0405060708	09/15/2009	Former Subpart 1	Whole	174,214	39/041
Delaware County	8-Hour Ozone (2008)	Columbus, OH	12131415	12/21/2016	Marginal	Whole	174,214	39/041
Delaware County	8-Hour Ozone (2015)	Columbus, OH	18	08/21/2019	Marginal	Whole	174,214	39/041
Delaware County	PM-2.5 (1997)-NAAQS revoked	Columbus, OH	0506070809101112	11/07/2013 *	Former Subpart 1	Whole	174,214	39/041
Fairfield County	8-Hour Ozone (1997)-NAAQS revoked	Columbus, OH	0405060708	09/15/2009	Former Subpart 1	Whole	146,156	39/045
Fairfield County	8-Hour Ozone (2008)	Columbus, OH	12131415	12/21/2016	Marginal	Whole	146,156	39/045
Fairfield County	8-Hour Ozone (2015)	Columbus, OH	18	08/21/2019	Marginal	Whole	146,156	39/045
Fairfield County	PM-2.5 (1997)-NAAQS revoked	Columbus, OH	0506070809101112	11/07/2013 *	Former Subpart 1	Whole	146,156	39/045
Franklin County	1-Hour Ozone (1979)-NAAQS revoked	Columbus, OH	92939495	04/01/1996	Marginal	Whole	1,163,414	39/049
Franklin County	8-Hour Ozone (1997)-NAAQS revoked	Columbus, OH	0405060708	09/15/2009	Former Subpart 1	Whole	1,163,414	39/049
Franklin County	8-Hour Ozone (2008)	Columbus, OH	12131415	12/21/2016	Marginal	Whole	1,163,414	39/049
Franklin County	8-Hour Ozone (2015)	Columbus, OH	18	08/21/2019	Marginal	Whole	1,163,414	39/049
Franklin County	PM-2.5 (1997)-NAAQS revoked	Columbus, OH	0506070809101112	11/07/2013 *	Former Subpart 1	Whole	1,163,414	39/049
Fulton County	Lead (2008)	Delta, OH	1011121314151617	03/13/2018		Part	3,243	39/051
Gallia County	PM-2.5 (1997)-NAAQS revoked	Huntington-Ashland, WV-KY-OH	05060708091011	12/31/2012 *	Former Subpart 1	Part	4,275	39/053
Gallia County	Sulfur Dioxide (1971)	Gallia County; Addison Township, OH	9293949596979899	07/05/2000		Part	2,197	39/053
Geauga County	1-Hour Ozone (1979)-NAAQS revoked	Cleveland-Akron-Lorain, OH	92939495	05/07/1996	Moderate	Whole	93,389	39/055
Geauga County	8-Hour Ozone (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0405060708	09/15/2009	Moderate	Whole	93,389	39/055
Geauga County	8-Hour Ozone (2008)	Cleveland-Akron-Lorain, OH	1213141516	01/06/2017	Marginal	Whole	93,389	39/055
Geauga County	8-Hour Ozone (2015)	Cleveland, OH	1819202122232425	/ /	Serious	Whole	93,389	39/055
Greene County	1-Hour Ozone (1979)-NAAQS revoked	Dayton-Springfield, OH	929394	07/05/1995	Moderate	Whole	161,573	39/057
Greene County	8-Hour Ozone (1997)-NAAQS revoked	Dayton-Springfield, OH	040506	08/13/2007	Former Subpart 1	Whole	161,573	39/057
Greene County	PM-2.5 (1997)-NAAQS revoked	Dayton-Springfield, OH	0506070809101112	09/26/2013 *	Former Subpart 1	Whole	161,573	39/057
Hamilton County	1-Hour Ozone (1979)-NAAQS revoked	Cincinnati-Hamilton, OH-KY	92939495969798990001020304	06/14/2005	Moderate	Whole	802,374	39/061
Hamilton County	8-Hour Ozone (1997)-NAAQS revoked	Cincinnati-Hamilton, OH-KY-IN	040506070809	05/11/2010	Former Subpart 1	Whole	802,374	39/061
Hamilton County	8-Hour Ozone (2008)	Cincinnati, OH-KY-IN	12131415	12/16/2016	Marginal	Whole	802,374	39/061
Hamilton County	8-Hour Ozone (2015)	Cincinnati, OH-KY	18192021	06/09/2022	Marginal	Whole	802,374	39/061
Hamilton County	PM-2.5 (1997)-NAAQS revoked	Cincinnati-Hamilton, OH-KY-IN	050607080910111213141516	04/07/2017 *	Former Subpart 1	Whole	802,374	39/061
Jefferson County	1-Hour Ozone (1979)-NAAQS revoked	Steubenville, OH	929394	03/10/1995	Section 185A	Whole	69,709	39/081
Jefferson County	8-Hour Ozone (1997)-NAAQS revoked	Steubenville-Weirton, OH-WV	040506	06/15/2007	Former Subpart 1	Whole	69,709	39/081
Jefferson County	PM-10 (1987)	Jefferson County, OH		01/10/2001	Moderate	Part	3,472	39/081
Jefferson County	PM-2.5 (1997)-NAAQS revoked	Steubenville-Weirton		09/18/2013 *	Former Subpart 1	Whole	69,709	39/081
Jefferson County	PM-2.5 (2006)	Steubenville-Weirton		09/18/2013	Former Subpart 1	Whole	69,709	39/081
Jefferson County	Sulfur Dioxide (1971)	Jefferson County; (pa Steubenville & Ming OH		09/29/1999		Part	69,712	39/081
Jefferson County	Sulfur Dioxide (2010)	Steubenville, OH-WV	131415161718	11/29/2019		Part	38,854	39/081
Knox County	8-Hour Ozone (1997)-NAAQS revoked	Columbus, OH	0405060708	09/15/2009	Former Subpart 1	Whole	60,921	39/083
Knox County	8-Hour Ozone (2008)	Columbus, OH	12131415	12/21/2016	Marginal	Whole	60,921	39/083
Lake County	1-Hour Ozone (1979)-NAAQS revoked	Cleveland-Akron-Lorain, OH	92939495	05/07/1996	Moderate	Whole	230,041	39/085
Lake County	8-Hour Ozone (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0405060708	09/15/2009	Moderate	Whole	230,041	39/085
Lake County	8-Hour Ozone (2008)	Cleveland-Akron-Lorain, OH	1213141516	01/06/2017	Marginal	Whole	230,041	39/085
Lake County	8-Hour Ozone (2015)	Cleveland, OH	1819202122232425	/ /	Serious	Whole	230,041	39/085
Lake County	PM-2.5 (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0506070809101112	09/18/2013 *	Former Subpart 1	Whole	230,041	39/085
Lake County	PM-2.5 (2006)	Cleveland-Akron-Lorain, OH	09101112	09/18/2013	Former Subpart 1	Whole	230,041	39/085
Lake County	Sulfur Dioxide (1971)	Lake County; (part) Eastlake, Timberlake, Lakeline, Willoughby, Mentor, OH	92939495969798	09/29/1999		Part	229,760	39/085
Lake County	Sulfur Dioxide (2010)	Lake County, OH	131415161718	05/14/2019		Whole	230,041	39/085
Lawrence County	PM-2.5 (1997)-NAAQS revoked	Huntington-Ashland, WV-KY-OH	05060708091011	12/31/2012 *	Former Subpart 1	Whole	62,450	39/087

The subject property is located in a Maintenance Area for 8-hour Ozone

County	NAAQS	Area Name	Nonattainment in Year	Redesignation to Maintenance	Classification	Whole or/ Part County	Population (2010)	State/ County FIPS Codes
Licking County	1-Hour Ozone (1979)-NAAQS revoked	Columbus, OH	92939495	04/01/1996	Marginal	Whole	166,492	39/089
Licking County	8-Hour Ozone (1997)-NAAQS revoked	Columbus, OH	0405060708	09/15/2009	Former Subpart 1	Whole	166,492	39/089
Licking County	8-Hour Ozone (2008)	Columbus, OH	12131415	12/21/2016	Marginal	Whole	166,492	39/089
Licking County	8-Hour Ozone (2015)	Columbus, OH	18	08/21/2019	Marginal	Whole	166,492	39/089
Licking County	PM-2.5 (1997)-NAAQS revoked	Columbus, OH	0506070809101112	11/07/2013 *	Former Subpart 1	Whole	166,492	39/089
Logan County	Lead (2008)	Bellefontaine, OH	10111213	09/26/2014		Part	6,220	39/091
Lorain County	1-Hour Ozone (1979)-NAAQS revoked	Cleveland-Akron-Lorain, OH	92939495	05/07/1996	Moderate	Whole	301,356	39/093
Lorain County	8-Hour Ozone (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0405060708	09/15/2009	Moderate	Whole	301,356	39/093
Lorain County	8-Hour Ozone (2008)	Cleveland-Akron-Lorain, OH	1213141516	01/06/2017	Marginal	Whole	301,356	39/093
Lorain County	8-Hour Ozone (2015)	Cleveland, OH	1819202122232425	/ /	Serious	Whole	301,356	39/093
Lorain County	PM-2.5 (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0506070809101112	09/18/2013 *	Former Subpart 1	Whole	301,356	39/093
Lorain County	PM-2.5 (2006)	Cleveland-Akron-Lorain, OH	09101112	09/18/2013	Former Subpart 1	Whole	301,356	39/093
Lorain County	PM-2.5 (2012)	Cleveland, OH	15161718	04/12/2019	Moderate	Whole	301,356	39/093
Lorain County	Sulfur Dioxide (1971)	Lorain County, OH	9293949596979899	07/05/2000		Part	301,074	39/093
Lucas County	1-Hour Ozone (1979)-NAAQS revoked	Toledo, OH	929394	08/01/1995	Moderate	Whole	441,815	39/095
Lucas County	8-Hour Ozone (1997)-NAAQS revoked	Toledo, OH	040506	08/09/2007	Former Subpart 1	Whole	441,815	39/095
Lucas County	Sulfur Dioxide (1971)	Lucas County, OH	92939495969798990001020 3	03/18/2004		Part	441,812	39/095
Madison County	8-Hour Ozone (1997)-NAAQS revoked	Columbus, OH	0405060708	09/15/2009	Former Subpart 1	Whole	43,435	39/097
Madison County	8-Hour Ozone (2008)	Columbus, OH	12131415	12/21/2016	Marginal	Whole	43,435	39/097
Mahoning County	1-Hour Ozone (1979)-NAAQS revoked	Youngstown-Warren-Sharon, OH-PA (OH portion)	92939495	04/01/1996 [Split]	Marginal	Whole	238,823	39/099
Mahoning County	8-Hour Ozone (1997)-NAAQS revoked	Youngstown-Warren-Sharon, OH-PA	040506	06/12/2007	Former Subpart 1	Whole	238,823	39/099
Medina County	1-Hour Ozone (1979)-NAAQS revoked	Cleveland-Akron-Lorain, OH	92939495	05/07/1996	Moderate	Whole	172,332	39/103
Medina County	8-Hour Ozone (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0405060708	09/15/2009	Moderate	Whole	172,332	39/103
Medina County	8-Hour Ozone (2008)	Cleveland-Akron-Lorain, OH	1213141516	01/06/2017	Marginal	Whole	172,332	39/103
Medina County	8-Hour Ozone (2015)	Cleveland, OH	1819202122232425	/ /	Serious	Whole	172,332	39/103
Medina County	PM-2.5 (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0506070809101112	09/18/2013 *	Former Subpart 1	Whole	172,332	39/103
Medina County	PM-2.5 (2006)	Cleveland-Akron-Lorain, OH	09101112	09/18/2013	Former Subpart 1	Whole	172,332	39/103
Miami County	1-Hour Ozone (1979)-NAAQS revoked	Dayton-Springfield, OH	929394	07/05/1995	Moderate	Whole	102,506	39/109
Miami County	8-Hour Ozone (1997)-NAAQS revoked	Dayton-Springfield, OH	040506	08/13/2007	Former Subpart 1	Whole	102,506	39/109
Montgomery County	1-Hour Ozone (1979)-NAAQS revoked	Dayton-Springfield, OH	929394	07/05/1995	Moderate	Whole	535,153	39/113
Montgomery County	8-Hour Ozone (1997)-NAAQS revoked	Dayton-Springfield, OH	040506	08/13/2007	Former Subpart 1	Whole	535,153	39/113
Montgomery County	PM-2.5 (1997)-NAAQS revoked	Dayton-Springfield, OH	0506070809101112	09/26/2013 *	Former Subpart 1	Whole	535,153	39/113
Morgan County	Sulfur Dioxide (1971)	Morgan County: Center Township, OH	9293	10/21/1994		Part	15,053	39/115
Morgan County	Sulfur Dioxide (2010)	Muskingum River, OH	1314151617181920212223242 5	/ /		Part	743	39/115
Portage County	1-Hour Ozone (1979)-NAAQS revoked	Cleveland-Akron-Lorain, OH	92939495	05/07/1996	Moderate	Whole	161,419	39/133
Portage County	8-Hour Ozone (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0405060708	09/15/2009	Moderate	Whole	161,419	39/133
Portage County	8-Hour Ozone (2008)	Cleveland-Akron-Lorain, OH	1213141516	01/06/2017	Marginal	Whole	161,419	39/133
Portage County	8-Hour Ozone (2015)	Cleveland, OH	1819202122232425	/ /	Serious	Whole	161,419	39/133
Portage County	PM-2.5 (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0506070809101112	09/18/2013 *	Former Subpart 1	Whole	161,419	39/133
Portage County	PM-2.5 (2006)	Cleveland-Akron-Lorain, OH	09101112	09/18/2013	Former Subpart 1	Whole	161,419	39/133
Preble County	1-Hour Ozone (1979)-NAAQS revoked	Preble County, OH	929394	03/10/1995	Section 185A	Whole	42,270	39/135
Scioto County	PM-2.5 (1997)-NAAQS revoked	Huntington-Ashland, WV-KY-OH	05060708091011	12/31/2012 *	Former Subpart 1	Whole	79,499	39/145
Stark County	1-Hour Ozone (1979)-NAAQS revoked	Canton, OH	92939495	04/01/1996	Marginal	Whole	375,586	39/151
Stark County	8-Hour Ozone (1997)-NAAQS revoked	Canton-Massillon, OH	040506	06/15/2007	Former Subpart 1	Whole	375,586	39/151
Stark County	Lead (2008)	Canton-Stark County, OH	232425	/ /		Part	6,188	39/151
Stark County	PM-2.5 (1997)-NAAQS revoked	Canton-Massillon, OH	0506070809101112	10/22/2013 *	Former Subpart 1	Whole	375,586	39/151
Stark County	PM-2.5 (2006)	Canton-Massillon, OH	09101112	10/22/2013	Former Subpart 1	Whole	375,586	39/151
Summit County	1-Hour Ozone (1979)-NAAQS revoked	Cleveland-Akron-Lorain, OH	92939495	05/07/1996	Moderate	Whole	541,781	39/153

County	NAAQS	Area Name	Nonattainment in Year	Redesignation to Maintenance	Classification	Whole or/ Part County	Population (2010)	State/ County FIPS Codes
Summit County	8-Hour Ozone (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0405060708	09/15/2009	Moderate	Whole	541,781	39/153
Summit County	8-Hour Ozone (2008)	Cleveland-Akron-Lorain, OH	1213141516	01/06/2017	Marginal	Whole	541,781	39/153
Summit County	8-Hour Ozone (2015)	Cleveland, OH	18192021222324 25	/ /	Serious	Whole	541,781	39/153
Summit County	PM-2.5 (1997)-NAAQS revoked	Cleveland-Akron-Lorain, OH	0506070809101112	09/18/2013 *	Former Subpart 1	Whole	541,781	39/153
Summit County	PM-2.5 (2006)	Cleveland-Akron-Lorain, OH	09101112	09/18/2013	Former Subpart 1	Whole	541,781	39/153
Trumbull County	1-Hour Ozone (1979)-NAAQS revoked	Youngstown-Warren-Sharon, OH-PA (OH portion)	92939495	04/01/1996 [Split]	Marginal	Whole	210,312	39/155
Trumbull County	8-Hour Ozone (1997)-NAAQS revoked	Youngstown-Warren-Sharon, OH-PA	040506	06/12/2007	Former Subpart 1	Whole	210,312	39/155
Warren County	1-Hour Ozone (1979)-NAAQS revoked	Cincinnati-Hamilton, OH-KY	929394959697989900010203 04	06/14/2005	Moderate	Whole	212,693	39/165
Warren County	8-Hour Ozone (1997)-NAAQS revoked	Cincinnati-Hamilton, OH-KY-IN	040506070809	05/11/2010	Former Subpart 1	Whole	212,693	39/165
Warren County	8-Hour Ozone (2008)	Cincinnati, OH-KY-IN	12131415	12/16/2016	Marginal	Whole	212,693	39/165
Warren County	8-Hour Ozone (2015)	Cincinnati, OH-KY	18192021	06/09/2022	Marginal	Whole	212,693	39/165
Warren County	PM-2.5 (1997)-NAAQS revoked	Cincinnati-Hamilton, OH-KY-IN	0506070809101112131415 16	04/07/2017 *	Former Subpart 1	Whole	212,693	39/165
Washington County	8-Hour Ozone (1997)-NAAQS revoked	Parkersburg-Marietta, WV-OH	040506	06/15/2007	Former Subpart 1	Whole	61,778	39/167
Washington County	PM-2.5 (1997)-NAAQS revoked	Parkersburg-Marietta, WV-OH	0506070809101112	08/29/2013 *	Former Subpart 1	Whole	61,778	39/167
Washington County	Sulfur Dioxide (1971)	Washington County: Waterford Township, OH	9293	10/21/1994		Part	61,777	39/167
Washington County	Sulfur Dioxide (2010)	Muskingum River, OH	1314151617181920212223 24 25	/ /		Part	3,713	39/167
Wood County	1-Hour Ozone (1979)-NAAQS revoked	Toledo, OH	929394	08/01/1995	Moderate	Whole	125,488	39/173
Wood County	8-Hour Ozone (1997)-NAAQS revoked	Toledo, OH	040506	08/09/2007	Former Subpart 1	Whole	125,488	39/173

Important Notes

Appendix G:

Coastal Zone Management

Coastal Zone Management Act (CEST and EA)

General requirements	Legislation	Regulation
Federal assistance to applicant agencies for activities affecting any coastal use or resource is granted only when such activities are consistent with federally approved State Coastal Zone Management Act Plans.	Coastal Zone Management Act (16 USC 1451-1464), particularly section 307(c) and (d) (16 USC 1456(c) and (d))	15 CFR Part 930
Reference		
https://www.onecpd.info/environmental-review/coastal-zone-management		

Projects located in the following states must complete this form.

Alabama	Florida	Louisiana	Mississippi	Ohio	Texas
Alaska	Georgia	Maine	New Hampshire	Oregon	Virgin Islands
American Samoa	Guam	Maryland	New Jersey	Pennsylvania	Virginia
California	Hawaii	Massachusetts	New York	Puerto Rico	Washington
Connecticut	Illinois	Michigan	North Carolina	Rhode Island	Wisconsin
Delaware	Indiana	Minnesota	Northern Mariana Islands	South Carolina	

1. Is the project located in, or does it affect, a Coastal Zone as defined in your state Coastal Management Plan?

☐ Yes → *Continue to Question 2.*

☑ No. → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map showing that the site is not within a Coastal Zone.*

2. Does this project include activities that are subject to state review?

☐ Yes → *Continue to Question 3.*

☐ No. → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide documentation used to make your determination.*

3. Has this project been determined to be consistent with the State Coastal Management Program?

☐ Yes, with mitigation. → *Continue to Question 4.*

☐ Yes, without mitigation. → Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide documentation used to make your determination.

☐ No, project must be canceled.

Project cannot proceed at this location.

4. Explain in detail the proposed measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.

→ *Continue to the Worksheet Summary below. Provide documentation of the consultation (including the State Coastal Management Program letter of consistency) and any other documentation used to make your determination.*

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

According to the National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management (OCM) accessed at https://coast.noaa.gov/czm/mystate/, Hamilton County is not located within a Coastal Management Zone. Therefore, the proposed undertaking is in compliance with HUD's Coastal Zone Management Act regulations and no consultation nor mitigation measures are warranted.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

Ohio Coastal Atlas Map Viewer

Subject Property

May 31, 2016

Coastal Management Area Boundary

0 25 50 100 mi

0 40 80 160 km

1:2,311,162

N

ODNR - Office of Coastal MGMT

Appendix H:

Site Contamination

Contamination and Toxic Substances (Multifamily and Non-Residential Properties)

General requirements	Legislation	Regulations
It is HUD policy that all properties that are being proposed for use in HUD programs be free of hazardous materials, contamination, toxic chemicals and gases, and radioactive substances, where a hazard could affect the health and safety of the occupants or conflict with the intended utilization of the property.		24 CFR 58.5(i)(2) 24 CFR 50.3(i)
Reference		
https://www.hudexchange.info/programs/environmental-review/site-contamination		

1. How was site contamination evaluated? Select all that apply.

- ☑ ASTM Phase I ESA
- ☐ ASTM Phase II ESA
- ☐ Remediation or clean-up plan
- ☑ ASTM Vapor Encroachment Screening
- ☐ None of the above

→ *Provide documentation and reports and include an explanation of how site contamination was evaluated in the Worksheet Summary. Continue to Question 2.*

2. Were any on-site or nearby toxic, hazardous, or radioactive substances found that could affect the health and safety of project occupants or conflict with the intended use of the property? (Were any recognized environmental conditions or RECs identified in a Phase I ESA and confirmed in a Phase II ESA?)

☐ No

Explain:

Dominion Due Diligence Group performed a Phase I Environmental Site Assessment (ESA) in conformance with the scope and limitations of ASTM Practice E1527-21 of the St. Theresa Village located at 6783 Siebern Avenue in Silverton, Hamilton County, Ohio (subject property). Any exceptions to, or deletions from, this practice are described in Section 2.4 of the Phase I ESA Report. This assessment has revealed no evidence of recognized environmental conditions (RECs), controlled recognized environmental conditions (CRECs), or significant data gaps in connection with the subject property.

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

☐ Yes

→ *Describe the findings, including any recognized environmental conditions (RECs), in Worksheet Summary below. Continue to Question 3.*

3. Mitigation

Document the mitigation needed according to the requirements of the appropriate federal, state, tribal, or local oversight agency. If the adverse environmental effects cannot be mitigated, then HUD assistance may not be used for the project at this site.

Can adverse environmental impacts be mitigated?

☐ Adverse environmental impacts cannot feasibly be mitigated

→ Project cannot proceed at this location.

☐ Yes, adverse environmental impacts can be eliminated through mitigation.

→ *Provide all mitigation requirements and documents. Continue to Question 4.*

4. Describe how compliance was achieved. Include any of the following that apply: State Voluntary Clean-up Program, a No Further Action letter, use of engineering controls , or use of institutional controls .

If a remediation plan or clean-up program was necessary, which standard does it follow?

☐ Complete removal

→ *Continue to the Worksheet Summary.*

☐ Risk-based corrective action (RBCA)

→ *Continue to the Worksheet Summary.*

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

Dominion Due Diligence Group performed a Phase I Environmental Site Assessment (ESA) in conformance with the scope and limitations of ASTM Practice E1527-21 of the St. Theresa Village located at 6783 Siebern Avenue in Silverton, Hamilton County, Ohio (subject property). Any exceptions to, or deletions from, this practice are described in Section 2.4 of the Phase I ESA Report. This assessment has revealed no evidence of recognized environmental conditions (RECs), controlled recognized environmental conditions (CRECs), or significant data gaps in connection with the subject property.

Therefore, the project is in compliance with HUD's Contamination and Toxic Substances regulations and no mitigation measures nor further investigations are warranted.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

Please see the Phase I Environmental Site Assessment (ESA), which is included under separate cover, for supporting documentation respective to the Contamination and Toxic Substances evaluation in accordance with 24 CFR 50.3(i) and 24 CFR 58.5(i)(2).

Appendix I:

Endangered Species Act

Endangered Species Act (CEST and EA)

General requirements	ESA Legislation	Regulations
Section 7 of the Endangered Species Act (ESA) mandates that federal agencies ensure that actions that they authorize, fund, or carry out shall not jeopardize the continued existence of federally listed plants and animals or result in the adverse modification or destruction of designated critical habitat. Where their actions may affect resources protected by the ESA, agencies must consult with the Fish and Wildlife Service and/or the National Marine Fisheries Service ("FWS" and "NMFS" or "the Services").	The Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.); particularly section 7 (16 USC 1536).	50 CFR Part 402
References		
https://www.hudexchange.info/environmental-review/endangered-species		

1. Does the project involve any activities that have the potential to affect species or habitats?

☑ No, the project will have No Effect due to the nature of the activities involved in the project.
→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination.*

☐ No, the project will have No Effect based on a letter of understanding, memorandum of agreement, programmatic agreement, or checklist provided by local HUD office.

Explain your determination:

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination.*

☐ Yes, the activities involved in the project have the potential to affect species and/or habitats.
→ *Continue to Question 2.*

2. Are federally listed species or designated critical habitats present in the action area?
Obtain a list of protected species from the Services. This information is available on the FWS Website or you may contact your local FWS and/or NMFS offices directly.

☐ No, the project will have No Effect due to the nature of the activities involved in the project.
→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination. Documentation may include*

letters from the Services, species lists from the Services' websites, surveys or other documents and analysis showing that there are no species in the action area.

☐ Yes, there are federally listed species or designated critical habitats present in the action area
→ *Continue to Question 3.*

3. What effects, if any, will your project have on federally listed species or designated critical habitat?

☐ No Effect: Based on the specifics of both the project and any federally listed species in the action area, you have determined that the project will have absolutely no effect on listed species or critical habitat.
→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination. Documentation should include a species list and explanation of your conclusion, and may require maps, photographs, and surveys as appropriate.*

☐ May Affect, Not Likely to Adversely Affect: Any effects that the project may have on federally listed species or critical habitats would be beneficial, discountable, or insignificant.
→ *Continue to Question 4, Informal Consultation.*

☐ Likely to Adversely Affect: The project may have negative effects on one or more listed species or critical habitat.
→ *Continue to Question 5, Formal Consultation.*

4. Informal Consultation is required

Section 7 of ESA (16 USC. 1536) mandates consultation to resolve potential impacts to endangered and threatened species and critical habitats. If a HUD-assisted project may affect any federally listed endangered or threatened species or critical habitat, then compliance is required with Section 7. See 50 CFR Part 402 Subpart B Consultation Procedures.

Did the Service(s) concur with the finding that the project is Not Likely to Adversely Affect?

☐ Yes, the Service(s) concurred with the finding.
→ *Based on the response, the review is in compliance with this section. Continue to Question 6 and provide the following:*
(1) A biological evaluation or equivalent document
(2) Concurrence(s) from FWS and/or NMFS
(3) Any other documentation of informal consultation

Exception: If finding was made based on procedures provided by a letter of understanding, memorandum of agreement, programmatic agreement, or checklist provided by local HUD office, provide whatever documentation is mandated by that agreement.

☐ No, the Service(s) did not concur with the finding.
→ *Continue to Question 5.*

5. Formal consultation is required

Section 7 of ESA (16 USC 1536) mandates consultation to resolve potential impacts to federally listed endangered and threatened species and critical habitats. If a HUD assisted project may affect any endangered or threatened species or critical habitat, then compliance is required with Section 7. See 50 CFR Part 402 Subpart B Consultation Procedures.

→ *Once consultation is complete, the review is in compliance with this section. Continue to Question 6 and provide the following:*

(1) A biological assessment, evaluation, or equivalent document
(2) Biological opinion(s) issued by FWS and/or NMFS
(3) Any other documentation of formal consultation

6. For the project to be brought into compliance with this section, all adverse impacts must be mitigated. Explain in detail the proposed measures that will be implemented to mitigate for the impact or effect, including the timeline for implementation.

☐ Mitigation as follows will be implemented:

☐ No mitigation is necessary.

Explain why mitigation will not be made here:

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

D3G obtained a Trust Resources Report for the subject property using the USFWS Information for Planning and Consultation (IPaC) website accessed at https://ecos.fws.gov/ipac/. According to the Report, four (4) federally-listed species have the potential to be present within the project area. The subject property is undergoing a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex. As there are no tree-clearing or land-clearing activities proposed, the proposed activities have no potential to affect species or habitats. Therefore, the proposed undertaking will have No Effect on federally-listed species or critical habitats. As such, the proposed undertaking will be in compliance with HUD's Endangered Species regulations and no consultation nor mitigation measures are warranted.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Hamilton County, Ohio

Local office

Ohio Ecological Services Field Office

(614) 416-8993
(614) 416-8994

4625 Morse Road, Suite 104
Columbus, OH 43230-8355

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Indiana Bat Myotis sodalis Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Clams

NAME	STATUS
Salamander Mussel Simpsonaias ambigua Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6208	Proposed Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their nests, should follow appropriate regulations and implement required avoidance and minimization measures, as described in the various links on this page.

The data in this location indicates that no eagles have been observed in this area. This does not mean eagles are not present in your project area, especially if the area is difficult to survey. Please review the 'Steps to Take When No Results Are Returned' section of the Supplemental Information on Migratory Birds and Eagles document to determine if your project is in a poorly surveyed area. If it is, you may need to rely on other resources to determine if eagles may be present (e.g. your local FWS field office, state surveys, your own surveys).

Additional information can be found using the following links:

NOT FOR CONSULTATION

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report
On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your "IPaC PROBABILITY OF PRESENCE SUMMARY" at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Measures for Proactively Minimizing Migratory Bird Impacts

Your IPaC Migratory Bird list showcases birds of concern, including Birds of Conservation Concern (BCC), in your project location. This is not a comprehensive list of all birds found in your project area. However, you can help proactively minimize significant impacts to all birds at your project location by implementing the measures in the Nationwide avoidance and minimization measures for birds document, and any other project-specific avoidance and minimization measures suggested at the link Measures for avoiding and minimizing impacts to birds for the birds of concern on your list below.

Ensure Your Migratory Bird List is Accurate and Complete

If your project area is in a poorly surveyed area, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles document, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

Review the FAQs
The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Cerulean Warbler Setophaga cerulea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 21 to Jul 20

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Chimney Swift Chaetura pelagica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Grasshopper Sparrow Ammodramus savannarum perpallidus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Prothonotary Warbler Protonotaria citrea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Semipalmated Sandpiper Calidris pusilla This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

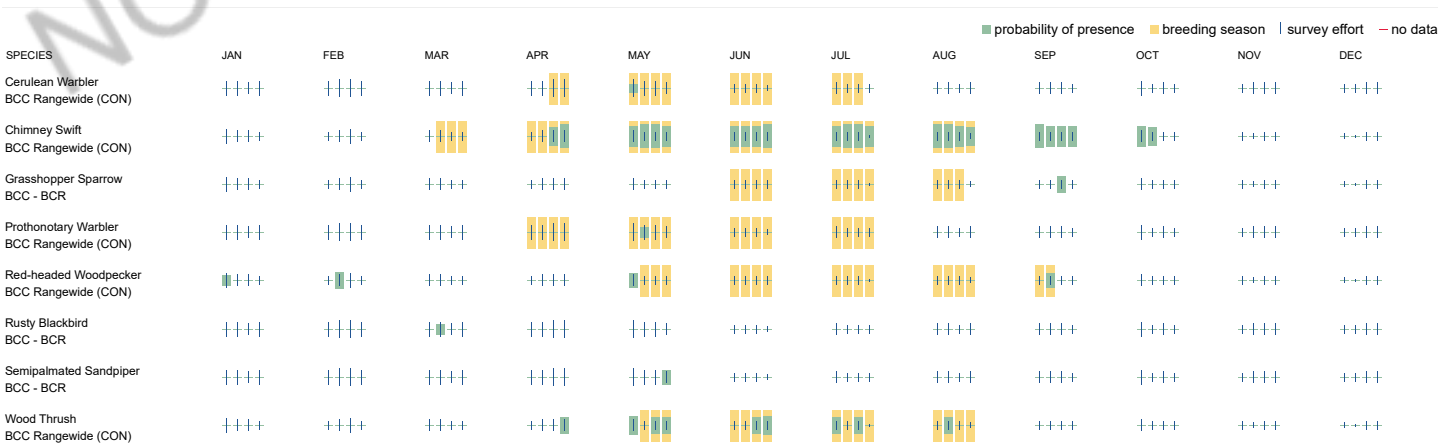
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

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The Migratory Bird Resource List is comprised of Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as "Vulnerable". See the FAQ "What are the levels of concern for migratory birds?" for more information on the levels of concern covered in the IPaC migratory bird species list.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle (Bald and Golden Eagle Protection Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the Rapid Avian Information Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your "IPaC PROBABILITY OF PRESENCE SUMMARY" at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Bald and Golden Eagle Protection Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ "Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Proper interpretation and use of your migratory bird report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list does not represent all birds present in your project area. It is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs
Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

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Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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Appendix J:

Explosive and Flammable Hazards

Explosive and Flammable Hazards (CEST and EA)

General requirements	Legislation	Regulation
HUD-assisted projects must meet Acceptable Separation Distance (ASD) requirements to protect them from explosive and flammable hazards.	N/A	24 CFR Part 51 Subpart C
Reference		
https://www.hudexchange.info/environmental-review/explosive-and-flammable-facilities		

1. Is the proposed HUD-assisted project itself the development of a hazardous facility (a facility that mainly stores, handles or processes flammable or combustible chemicals such as bulk fuel storage facilities and refineries)?

☑ No.
→ *Continue to Question 2.*

☐ Yes

Explain:

→ *Go directly to Question 5.*

2. Does this project include any of the following activities: development, construction, rehabilitation that will increase residential densities, or conversion?

☑ No
→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

☐ Yes
→ Continue to Question 3.

3. Within 1 mile of the project site, are there any current or planned stationary aboveground storage containers that are covered by 24 CFR 51C? Containers that are NOT covered under the regulation include:

- Containers 100 gallons or less in capacity, containing common liquid industrial fuels
  OR
- Containers of liquified petroleum gas (LPG) or propane with a water volume capacity of 1,000 gallons or less that meet the requirements of the 2017 or later version of National Fire Protection Association (NFPA) Code 58.

If all containers within the search area fit the above criteria, answer "no." For any other type of aboveground storage container within the search area that holds one of the flammable or explosive materials listed in Appendix I of 24 CFR part 51 subpart C, answer "yes."

☐ No

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide all documents used to make your determination.*

☐ Yes
→ *Continue to Question 4.*

4. Visit HUD's website to identify the appropriate tank or tanks to assess and to calculate the required separation distance using the electronic assessment tool. To document this step in the analysis, please attach the following supporting documents to this screen:

- **Map identifying the tank selected for assessment, and showing the distance from the tank to the proposed HUD-assisted project site; and**
- **Electronic assessment tool calculation of the required separation distance.**

Based on the analysis, is the proposed HUD-assisted project site located at or beyond the required separation distance from all covered tanks?

☐ Yes
→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

☐ No
→ *Go directly to Question 6.*

5. Is the hazardous facility located at an acceptable separation distance from residences and any other facility or area where people may congregate or be present?

Please visit HUD's website for information on calculating Acceptable Separation Distance.

☐ Yes
→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide map(s) showing the location of the project site relative to residences and any other facility or area where people congregate or are present and your separation distance calculations.*

☐ No
→ *Provide map(s) showing the location of the project site relative to residences and any other facility or area where people congregate or are present and your separation distance calculations. Continue to Question 6.*

6. For the project to be brought into compliance with this section, all adverse impacts must be mitigated. Mitigation measures may include both natural and manmade barriers, modification of the project design, burial or removal of the hazard, or other engineered solutions. Describe selected mitigation measures, including the timeline for implementation, and attach an implementation plan. If negative effects cannot be mitigated, cancel the project at this location.

Note that only licensed professional engineers should design and implement blast barriers. If a barrier will be used or the project will be modified to compensate for an unacceptable separation distance, provide approval from a licensed professional engineer.

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

According to 24 CFR Part 51, Subpart C - Siting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature, a HUD-assisted project involves the development, construction, rehabilitation or modernization involving an increase in residential unit densities, or conversion of any project that is intended for residential, institutional, recreational, commercial, or industrial uses. Based on the activities involved in the proposed undertaking (The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex), the project is not considered a HUD-assisted project and compliance with 24 CFR Part 51, Subpart C is not warranted.

To assist HUD with their substantive evaluation of risk associated with proximity to hazardous facilities per the HUD MAP Guide, D3G reviewed NEPAssist information accessed at https://nepassisttool.epa.gov/nepassist/nepamap.aspx, along with visual observations during the site visit conducted by D3G on September 23, 2025. There are no stationary aboveground storage tanks (ASTs) containing liquid fuel (other than LPG/propane tanks that do not exceed 1,000 gallons in water capacity and which submit documentation that they are in compliance with NFPA Code 58 (2017), or common liquid industrial fuels with a capacity of 100 gallons or less), or tanks of any size containing pressurized gas on or adjacent to the subject property that could impact the HUD project.

Several ASTs were observed within one (1) mile of the subject property. Utilizing the HUD ASD Electronic Assessment Tool accessed at https://www.hudexchange.info/environmental-review/asd-calculator/, D3G determined a set of parameters that must apply for any vicinity AST within one (1) mile of the subject property to require further evaluation. The following are the minimum AST sizes within the specified radii which require further evaluation: 1/8 mile (or 660 feet) radius at 8,000 gallons; 1/4 mile (or 1,320 feet) radius at 42,650 gallons; 1/2 mile (or 2,640 feet) radius at 225,000 gallons; and 1 mile (or 5,280 feet) radius at 1,187,500 gallons. No ASTs (outside of any previously discussed on-site or adjacent/visible ASTs) up to 8,000 gallons were observed within 1/8 mile; no ASTs ranging from 8,000 to 42,650 gallons were observed from 1/8 mile to 1/4 mile radius of the subject property; no ASTs ranging from 42,650 to 225,000 gallons were observed from 1/4 mile to 1/2 mile radius of the subject property; and no ASTs ranging from 225,000 to 1,187,500 gallons were observed from 1/2 mile to 1 mile radius of the subject property.

In addition, D3G contacted the Hamilton County Fire Department for any current or recent (w/in the past year) permits issued for thermal/explosive hazards (ASTs > 100 gallons) located within a one (1) mile radius of the subject property. However, a response is not yet been received.

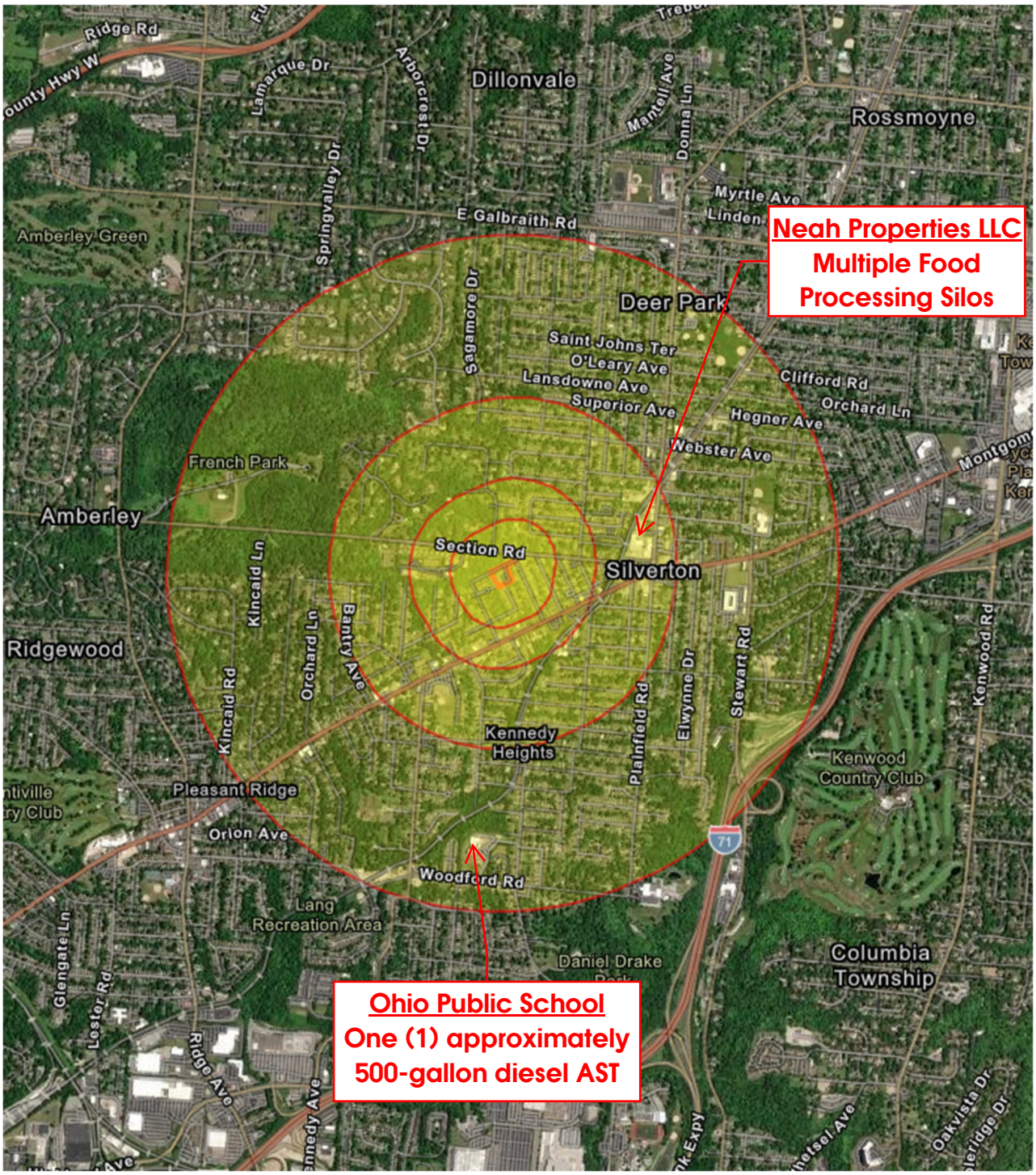
Therefore, the project is in compliance with HUD’s Explosive and Flammable Hazards requirements.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

ASTs Map w/ 1/8, ¼, ½, and 1 Mile Buffers



Minimum AST Sizes w/in Radii Which Require Further Evaluation	
Radius	Minimum AST Size
1/8 Mile (or 660 feet)	8,000 Gallons
1/4 Mile (or 1,320 feet)	42,650 Gallons
1/2 Mile (or 2,640 feet)	225,000 Gallons
1 Mile (or 5,280 feet)	1,187,500 Gallons

ASD Calculations for 1/8 Mile Radius

Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	8000
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	657.70
ASD for Thermal Radiation for Buildings (ASDBPU)	131.49
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options (/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)

Providing Feedback & Corrections

After using the ASD Assessment Tool following the directions in this User Guide, users are encouraged to provide feedback on how the ASD Assessment Tool may be improved. Users are also encouraged to send comments or corrections for the improvement of the tool.

Please send comments or other input using **Ask A Question (/ask-a-question/my-question/)**. Enter "Environmental Review" in the "My question is related to" field.

Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**
- **ASD Flow Chart (/resource/3840/acceptable-separation-distance-asd-flowchart/)**

ASD Calculations for 1/8 Mile Radius

Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☑ **No:** ☐
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☑
Is the container diked?	**Yes:** ☐ **No:** ☐
What is the volume (gal) of the container?	8000
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	435.57
ASD for Thermal Radiation for People (ASDPPU)	657.70
ASD for Thermal Radiation for Buildings (ASDBPU)	131.49
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options (/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)

Providing Feedback & Corrections

After using the ASD Assessment Tool following the directions in this User Guide, users are encouraged to provide feedback on how the ASD Assessment Tool may be improved. Users are also encouraged to send comments or corrections for the improvement of the tool.

Please send comments or other input using **Ask A Question (/ask-a-question/my-question/)**. Enter "Environmental Review" in the "My question is related to" field.

Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**
- **ASD Flow Chart (/resource/3840/acceptable-separation-distance-asd-flowchart/)**

ASD Calculations for 1/4 Mile Radius

Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	42650
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	1320.76
ASD for Thermal Radiation for Buildings (ASDBPU)	285.04
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options (/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)

Providing Feedback & Corrections

After using the ASD Assessment Tool following the directions in this User Guide, users are encouraged to provide feedback on how the ASD Assessment Tool may be improved. Users are also encouraged to send comments or corrections for the improvement of the tool.

Please send comments or other input using **Ask A Question (/ask-a-question/my-question/)**. Enter "Environmental Review" in the "My question is related to" field.

Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**
- **ASD Flow Chart (/resource/3840/acceptable-separation-distance-asd-flowchart/)**

ASD Calculations for 1/4 Mile Radius

Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☑ **No:** ☐
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☑
Is the container diked?	**Yes:** ☐ **No:** ☐
What is the volume (gal) of the container?	42650
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	757.45
ASD for Thermal Radiation for People (ASDPPU)	1320.76
ASD for Thermal Radiation for Buildings (ASDBPU)	285.04
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options (/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)

Providing Feedback & Corrections

After using the ASD Assessment Tool following the directions in this User Guide, users are encouraged to provide feedback on how the ASD Assessment Tool may be improved. Users are also encouraged to send comments or corrections for the improvement of the tool.

Please send comments or other input using **Ask A Question (/ask-a-question/my-question/)**. Enter "Environmental Review" in the "My question is related to" field.

Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**
- **ASD Flow Chart (/resource/3840/acceptable-separation-distance-asd-flowchart/)**

ASD Calculations for 1/2 Mile Radius

Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	225000
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	2640.70
ASD for Thermal Radiation for Buildings (ASDBPU)	614.91
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options (/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)

Providing Feedback & Corrections

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Please send comments or other input using **Ask A Question (/ask-a-question/my-question/)**. Enter "Environmental Review" in the "My question is related to" field.

Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**
- **ASD Flow Chart (/resource/3840/acceptable-separation-distance-asd-flowchart/)**

ASD Calculations for 1/2 Mile Radius

Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☑ **No:** ☐
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☑
Is the container diked?	**Yes:** ☐ **No:** ☐
What is the volume (gal) of the container?	225000
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	1312.60
ASD for Thermal Radiation for People (ASDPPU)	2640.70
ASD for Thermal Radiation for Buildings (ASDBPU)	614.91
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options (/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)

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Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**
- **ASD Flow Chart (/resource/3840/acceptable-separation-distance-asd-flowchart/)**

ASD Calculations for 1 Mile Radius

Acceptable Separation Distance (ASD) Electronic Assessment Tool

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Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	1187500
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	5280.71
ASD for Thermal Radiation for Buildings (ASDBPU)	1326.79
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options (/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)

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Related Information

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- **ASD Flow Chart (/resource/3840/acceptable-separation-distance-asd-flowchart/)**

ASD Calculations for 1 Mile Radius

Acceptable Separation Distance (ASD) Electronic Assessment Tool

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Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☑ **No:** ☐
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☑
Is the container diked?	**Yes:** ☐ **No:** ☐
What is the volume (gal) of the container?	1187500
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	2274.96
ASD for Thermal Radiation for People (ASDPPU)	5280.71
ASD for Thermal Radiation for Buildings (ASDBPU)	1326.79
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options (/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)

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Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**
- **ASD Flow Chart (/resource/3840/acceptable-separation-distance-asd-flowchart/)**

Fire Contact:	Fire official	**From:** Compliance Department	
Municipality:	Hamilton County	**Department:**	Fire
Phone:	804-665-2902	**Fax:**	Email: comp@d3g.com
Pages:	2	**Date:**	09/11/2025

☒ Urgent ☐ For Review ☐ Please Comment ☒ Please Reply ☐ Please Recycle

To meet the financing requirements of the loan program, Dominion Due Diligence Group is requesting your assistance on behalf of:

National Church Residences
2245 North Bank Drive
Columbus, OH 43220

This information is required for the HUD re-financing report for the following property:

St. Theresa Village
6783 Siebern Avenue
Cincinnati, OH 45236

Please email completed letter to my attention at comp@d3g.com.

If unable to send via email, please fax to me at 804-588-5758 before mailing a hard copy to my attention.

Thank you for your time,

Compliance Department
P: 804-665-2902 F: 804-588-5758 E: comp@d3g.com

[2025-001881] **Initials:** CD

COMPLIANCE REQUEST:
Fire and Code Enforcement Verifications

Date: 09/11/2025

Completed By: Name & Title: _____
Department: _____
Direct Contact Info: _____

Re: Property: St. Theresa Village
Address: 6783 Siebern Avenue
City, State & Zip: Cincinnati, OH 45236

Requestor: National Church Residences
2245 North Bank Drive
Columbus, OH 43220

Dominion Due Diligence Group is requesting your assistance on behalf of the above referenced requestor. Please confirm whether the above noted subject property has any known outstanding fire code violations.

1. To the best of our knowledge, the property is free of any applicable code violations.

Yes No Reason: _____

2. **Last Inspection Date:** _____

If available, attach the inspection report. Please list the frequency in which inspections are required. If no inspections are required, please list municipality's policy:

_____

3. Are any permits available for former or current underground storage tanks?

Yes If yes, please attach all related information.

No If no, can you provide a department to contact for additional information.

4. Has the fire department responded to any hazmat spills at the property?

Yes If yes, please attach all related information.

No If no, can you provide a department to contact for additional information.

5. Are there any current or recent (within the past year) permits issued for thermal/explosive hazards (aboveground storage tanks >100 gallons) located within a one (1) mile radius of the subject property?

Yes If yes, please attach a copy of all available information. No

6. Has your jurisdiction adopted the 2017 edition (or newer) of the National Fire Protection Association (NFPA) 58 Liquefied Petroleum Gas Code?

Yes No

_____ _____

Fire Official Signature Date

Penelope Huhmann

From: Compliance Department
Sent: Tuesday, October 7, 2025 3:11 PM
To: sfm_codeenf@com.ohio.gov
Cc: Lexi Brass
Subject: FOIA Request -St. Theresa Village -OTTER Request

Apologies, I made some mistakes in my initial request email. Please respond to this one instead.
Thank you,

From: Compliance Department
Sent: Tuesday, October 7, 2025 3:06 PM
To: sfm_codeenf@com.ohio.gov
Cc: Lexi Brass <l.brass@d3g.com>
Subject: FOIA Request -St. Theresa Village -OTTER Request

Good afternoon,
I am writing in request of information that is needed for a re-financing loan report regarding St. Theresa Village, located at 6783 Siebern Avenue (PIN: 602-0001-0059-00 (2.171 AC) & 060200010432 (1.3 AC)) in Silverton, OH. I am requesting it on behalf of National Church Residences. Please let me know if more information is needed if fees are involved or if another municipality needs to be contacted.
I would like any permits for above/underground storage tanks for the address and parcel listed above.
Thank you,

Appendix K:

Farmlands Protection

Farmlands Protection (CEST and EA)

General requirements	Legislation	Regulation
The Farmland Protection Policy Act (FPPA) discourages federal activities that would convert farmland to nonagricultural purposes.	Farmland Protection Policy Act of 1981 (7 U.S.C. 4201 et seq.)	7 CFR Part 658
Reference		
https://www.hudexchange.info/environmental-review/farmlands-protection		

1. Does your project include any activities, including new construction, acquisition of undeveloped land or conversion, that could convert agricultural land to a non-agricultural use?

☐ Yes. → *Continue to Question 2.*

☑ No

Explain how you determined that agricultural land would not be converted:

The proposed undertaking involves the Sponsor submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex with no proposed new construction or land conversion activities. Therefore, the proposed undertaking does not involve the conversion of agricultural land and is not subject to the provisions of the Farmlands Protection Policy Act.

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documentation supporting your determination.*

2. Does "important farmland," including prime farmland, unique farmland, or farmland of statewide or local importance regulated under the Farmland Protection Policy Act, occur on the project site?

You may use the links below to determine important farmland occurs on the project site:

- Utilize USDA Natural Resources Conservation Service's (NRCS) Web Soil Survey http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm
- Check with your city or county's planning department and ask them to document if the project is on land regulated by the FPPA (zoning important farmland as non-agricultural does not exempt it from FPPA requirements)
- Contact NRCS at the local USDA service center http://offices.sc.egov.usda.gov/locator/app?agency=nrcs or your NRCS state soil scientist for assistance

☐ No → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination.*

☐ Yes → *Continue to Question 3.*

3. Consider alternatives to completing the project on important farmland and means of avoiding impacts to important farmland.

- Complete form **AD-1006**, "Farmland Conversion Impact Rating" http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045394.pdf and contact the state soil scientist before sending it to the local NRCS District Conservationist.
  (NOTE: for corridor type projects, use instead form **NRCS-CPA-106**, Farmland Conversion Impact Rating for Corridor Type Projects: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045395.pdf.)
- Work with NRCS to minimize the impact of the project on the protected farmland. When you have finished with your analysis, return a copy of form AD-1006 (or form NRCS-CPA-106 if applicable) to the USDA-NRCS State Soil Scientist or his/her designee informing them of your determination.

Document your conclusion:

☐ Project will proceed with mitigation.

Explain in detail the proposed measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide form AD-1006 and all other documents used to make your determination.*

☐ Project will proceed without mitigation.

Explain why mitigation will not be made here:

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide form AD-1006 and all other documents used to make your determination.*

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

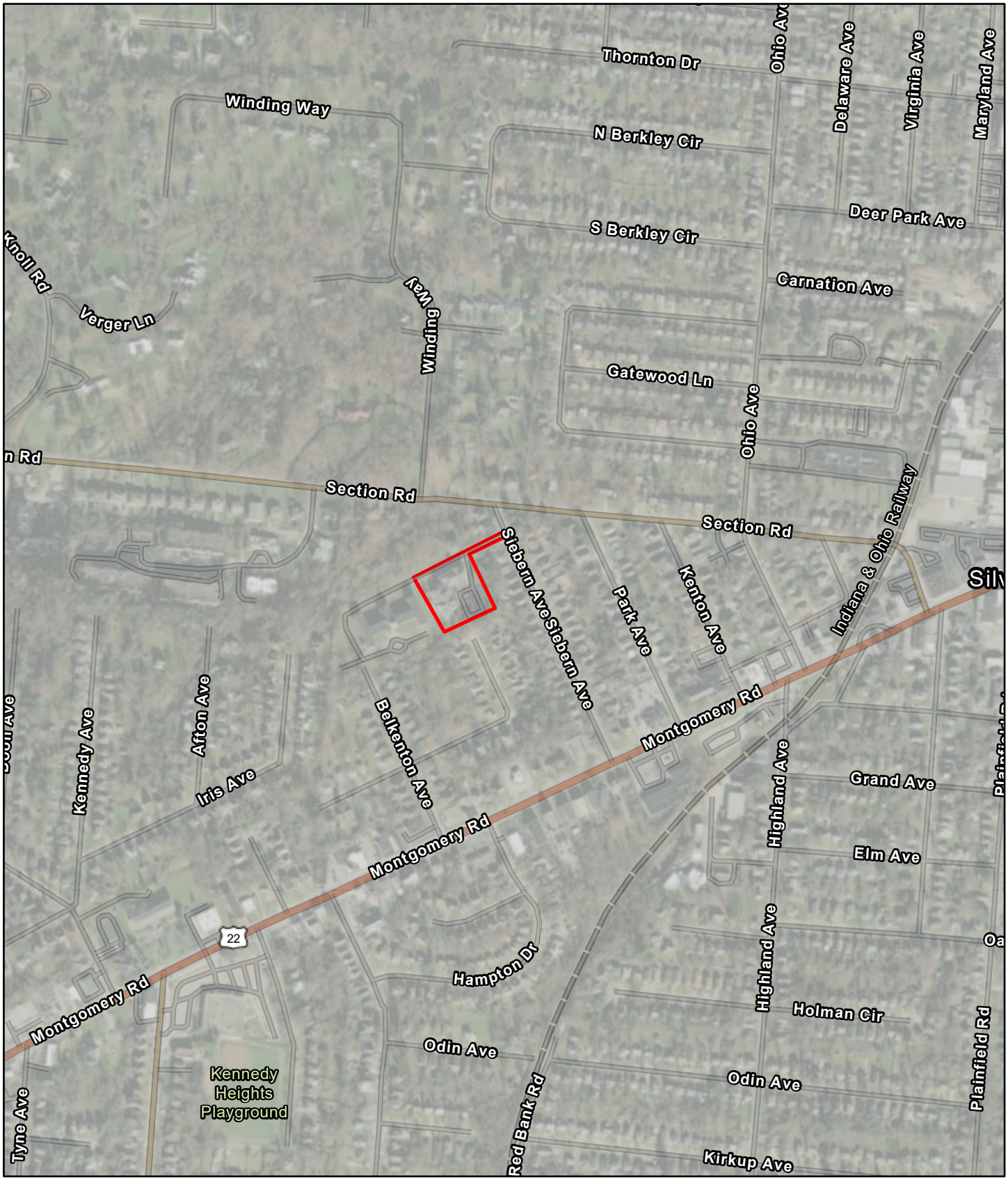
The proposed undertaking involves the Sponsor submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex with no proposed new construction or land conversion activities. Therefore, the proposed undertaking does not involve the conversion of agricultural land and is not subject to the provisions of the Farmlands Protection Policy Act. In addition, according to the U.S. Census Bureau Urbanized Area Map, accessed at http://tigerweb.geo.census.gov/tigerweb/, the subject property is located within an urbanized area; therefore, the subject property is already in an area committed to urban development and is exempt from compliance with the Farmland Protection Policy Act per 7 CFR Part 658.2. The project is in compliance with HUD's Farmlands regulations and no mitigation is warranted.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

Urban Areas



September 24, 2025

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Project 1

Urban Areas

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Maxar, EPA OEI

Appendix L:

Floodplain Management

Floodplain Management (CEST and EA)

General Requirements	Legislation	Regulation
Executive Order 11988, Floodplain Management, requires Federal activities to avoid impacts to floodplains and to avoid direct and indirect support of floodplain development to the extent practicable.	Executive Order 11988 Executive Order 13690 42 USC 4001-4128 42 USC 5154a	24 CFR 55
Reference		
https://www.hudexchange.info/environmental-review/floodplain-management		

1. Does this project meet an exemption at 24 CFR 55.12 from compliance with HUD's floodplain management regulations in Part 55 or utilize the delayed compliance date for certain Office of Housing programs?

☐ Yes

Select the applicable citation at 24 CFR 55.12 and provide supporting documentation for the determination if applicable.

a) ☐ HUD-assisted activities described in 24 CFR 58.34 and 58.35(b)

b) ☐ HUD-assisted activities described in 24 CFR 50.19, except as otherwise indicated in § 50.19

c) ☐ The approval of financial assistance for restoring and preserving the natural and beneficial functions and values of floodplains and wetlands, including through acquisition of such floodplain and wetland property, where a permanent covenant or comparable restriction is place on the property's continued use for flood control, wetland projection, open space, or park land, but only if:

(1) The property is cleared of all existing buildings and walled structures; and

(2) The property is cleared of related improvements except those which:

(i) Are directly related to flood control, wetland protection, open space, or park land (including playgrounds and recreation areas);

(ii) Do not modify existing wetland areas or involve fill, paving, or other ground disturbance beyond minimal trails or paths; and

(iii) Are designed to be compatible with the beneficial floodplain or wetland function of the property.

d) ☐ An action involving a repossession, receivership, foreclosure, or similar acquisition of property to protect or enforce HUD's financial interests under previously approved loans, grants, mortgage insurance, or other HUD assistance

e) ☐ Policy-level actions described at 24 CFR 50.16 that do not involve site-based decisions

f) ☐ A minor amendment to a previously approved action with no additional adverse impact on or from a floodplain or wetland;

g) ☐ HUD's or the responsible entity's approval of a project site, an incidental portion of which is situated in the FFRMS floodplain (not including the floodway, LiMWA, or coastal high hazard area) but only if:

(1) The proposed project site does not include any existing or proposed buildings or improvements that modify or occupy the FFRMS floodplain except de minimis improvements such as recreation areas and trails; and

(2) the proposed project will not result in any new construction in or modifications of a wetland

h) ☐ Issuance or use of Housing Vouchers or other forms of rental subsidy where HUD, the awarding community, or the public housing agency that administers the contract awards rental subsidies that are not project-based (i.e., do not involve site-specific subsidies)

i) ☐ Special projects directed to the removal of material and architectural barriers that restrict the mobility of and accessibility to elderly and persons with disabilities.

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

☐ Yes. Office of Housing programs utilizing the January 1, 2025 compliance date. These reviews must comply with the 2013 version of the Part 55 regulations. Continue to Worksheet Summary for 2013 version to upload supporting documentation.

☑ No *Continue to Question 2.*

2. Does the project include a Critical Action?

☐ Yes. Describe the Critical Action. Examples of Critical Actions include projects involving hospitals, fire and police stations, nursing homes, hazardous chemical storage, storage of valuable records, and utility plants. Continue to Question 4.

☑ No. *Continue to Question 3.*

3. Determine the extent of the FFRMS floodplain and provide mapping documentation in support of that determination.

The extent of the FFRMS floodplain can be determined using a Climate Informed Science Approach (CISA), 0.2 percent flood approach (0.2 PFA), or freeboard value approach (FVA). For projects in areas without available CISA data or without FEMA Flood Insurance Rate Maps (FIRMs), Flood Insurance Studies (FISs) or Advisory Base Flood Elevations (ABFEs), use the best available information to determine flood elevation. Include documentation and an explanation of why this is the best available information for the site. Note that newly constructed and substantially improved structures must be elevated to the FFRMS floodplain regardless of the approach chosen to determine the floodplain.

Select one of the following three options:

☐ CISA for non-critical actions. If using a local tool, data, or resources, ensure that the FFRMS elevation is higher than would have been determined using the 0.2 PFA or the FVA.

☑ 0.2-PFA. Where FEMA has defined the 0.2-percent-annual-chance floodplain, the FFRMS floodplain is the area that FEMA has designated as within the 0.2-percent-annual-chance floodplain.

☐ FVA. If neither CISA nor 0.2-PFA is available, for non-critical actions, the FFRMS floodplain is the area that results from adding two feet to the base flood elevation as established by the effective FIRM or FIS or—if available —a FEMA-provided preliminary or pending FIRM or FIS or advisory base flood elevations, whether regulatory or informational in nature. However, an interim or preliminary FEMA map cannot be used if it is lower than the current FIRM or FIS.

a. Does your project occur in the FFRMS floodplain?

☐ Yes, continue to part b.

☑ No. Review for floodplain management is complete.

b. Is your project located in any of the floodplain categories below? Select all that apply. If none apply, continue to question 7.

☐ Floodway: *Continue to Question 5. Floodways.*

☐ Coastal High Hazard Area (V Zone) or Limit of Moderate Wave Action (LiMWA): *Continue to Question 6. Coastal High Hazard Areas and LiMWAs.*

4. Determine the extent of the FFRMS floodplain and provide mapping documentation in support of that determination.

The extent of the FFRMS floodplain can be determined using a Climate Informed Science Approach (CISA), or the higher of the 0.2 percent flood approach (0.2 PFA), or freeboard value approach (FVA). For projects in areas without available CISA data or without FEMA Flood Insurance Rate Maps (FIRMs), Flood Insurance Studies (FISs) or Advisory Base Flood Elevations (ABFEs), use the best available information to determine flood elevation. Note that newly constructed and substantially improved structures must be elevated to the FFRMS floodplain regardless of the approach chosen to determine the floodplain.

Utilize CISA to determine the FFRMS floodplain for critical actions

☐ CISA for Critical Actions. If using a local tool, ensure that the FFRMS elevation provided is higher than the 0.2 PFA or 3’ above the base flood elevation.

OR;

Choose the higher of 0.2 PFA or FVA elevations

☐ 0.2-PFA. Where FEMA has defined the 0.2-percent-annual-chance floodplain, the FFRMS floodplain is the area that FEMA has designated as within the 0.2-percent-annual-chance floodplain.

☐ FVA. For critical actions, the FFRMS floodplain is the area that results from adding three feet to the base flood elevation as established by the effective FEMA FIRM or FIS or—if available —a FEMA-provided preliminary or pending FIRM or FIS or advisory base flood elevations, whether regulatory or informational in nature. However, an interim or preliminary FEMA map cannot be used if it is lower than the current FIRM or FIS.

a. Does your project occur in the FFRMS floodplain?

☐ Yes, continue to part b.

☐ No. Review for floodplain management is complete.

b. Is your project located in any of the floodplain categories below? Select all that apply. If none apply, continue to question 7.

☐ Floodway: *Continue to Question 5. Floodways.*

☐ Coastal High Hazard Area (V Zone) or Limit of Moderate Wave Action (LiMWA): *Continue to Question 6. Coastal High Hazard Areas and LiMWAs.*

5. Floodways

Do the floodway exemptions at 55.8 or 55.21 apply?

☐ Yes

The 8-Step Process is required. Document mitigation measures necessary to meet the requirements in 55.8 or 55.21. Provide a completed 8-Step Process, including the early public notice and the final notice. *Continue to Question 7. 8-Step Process.*

☐ No

Federal assistance may not be used at this location. You must either choose an alternate site or cancel the project at this location.

6. Coastal High Hazard Area (V Zone) and LiMWAs

Do the exemptions at 55.8 or 55.21 apply?

☐ Yes

The 8-Step Process is required. Document mitigation measures necessary to meet the requirements in 55.8 or 55.21. Provide a completed 8-Step Process, including the early public notice and the final notice. *Continue to Question 7. 8-Step Process.*

☐ No

Federal assistance may not be used at this location. You must either choose an alternate site or cancel the project at this location.

7. 8-Step Process.

Does the 8-Step Process apply? Select one of the following options:

☐ 8-Step Process is inapplicable per 55.13.

Select the applicable citation:

☐ (a) HUD's mortgage insurance actions and other financial assistance for the purchasing, mortgaging, or refinancing of existing one- to four-family properties in communities that are in the Regular Program of the NFIP and in good standing (i.e., not suspended from program eligibility or placed on probation under 44 CFR 59.24), where the action is not a critical action and the property is not located in a floodway, coastal high hazard area, or LiMWA;

☐ (b) Financial assistance for minor repairs or improvements on one- to four-family properties that do not meet the thresholds for “substantial improvement” under § 55.2(b)(12);

☐ (c) HUD or a recipient's actions involving the disposition of individual HUD or recipient held, one- to four-family properties;

☐ (d) HUD guarantees under the Loan Guarantee Recovery Fund Program (24 CFR part 573), where any new construction or rehabilitation financed by the existing loan or mortgage has been completed prior to the filing of an application under the program, and the refinancing will not allow further construction or rehabilitation, nor result in any physical impacts or changes except for routine maintenance;

☐ (e) The approval of financial assistance to lease units within an existing structure located within the floodplain, but only if;

(1) The structure is located outside the floodway or coastal high hazard area, and is in a community that is in the Regular Program of the NFIP and in good standing (i.e., not suspended from program eligibility or placed on probation under 44 CFR 59.24); and
(2) The project is not a critical action; and
(3) The entire structure is or will be fully insured or insured to the maximum extent available under the NFIP for at least the term of the lease.

☐ (f) Special projects for the purpose of improving efficiency of utilities or installing renewable energy that involve the repair, rehabilitation, modernization, weatherization, or improvement of existing structures or infrastructure, do not meet the thresholds for “substantial improvement” under § 55.2(b)(12), and do not include the installation of equipment below the FFRMS floodplain elevation.

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

☐ 5-Step Process is applicable per 55.14.
Provide documentation of 5-Step Process.
Select the applicable citation:

☐ (a) HUD actions involving the disposition of HUD-acquired multifamily housing projects or “bulk sales” of HUD-acquired one- to four-family properties in communities that are in the Regular Program of the National Flood Insurance Program (NFIP) and in good standing (i.e., not suspended from program eligibility or placed on probation under 44 CFR 59.24).

☐ (b)HUD's actions under the National Housing Act (12 U.S.C. 1701) for the purchase or refinancing of existing multifamily housing projects, hospitals, nursing homes, assisted living facilities, board and care facilities, and intermediate care facilities, in communities that are in good standing under the NFIP.

☐ (c) HUD's or the recipient’s actions under any HUD program involving the repair, rehabilitation, modernization, weatherization, or improvement of existing multifamily housing projects, hospitals, nursing homes, assisted living facilities, board and care facilities, intermediate care facilities, and one- to four-family properties, in communities that are in the Regular Program of the National Flood Insurance Program (NFIP) and are in good standing, provided that the number of units is not increased more than 20 percent, the action does not involve a conversion from nonresidential to residential land use, the action does not meet the thresholds for “substantial improvement” under § 55.2(b)(10), and the footprint of the structure and paved areas is not increased by more than 20 percent.

☐ (d) HUD’s (or the recipient’s) actions under any HUD program involving the repair, rehabilitation, modernization, weatherization, or improvement of existing nonresidential buildings and structures, in communities that are in the Regular Program of the NFIP and are in good standing, provided that the action does not meet the thresholds for “substantial improvement” under § 55.2(b)(10) and that the footprint of the structure and paved areas is not increased by more than 20 percent

☐ (e) HUD's or the recipient's actions under any HUD program involving the repair, rehabilitation, or replacement of existing nonstructural improvements including streets, curbs and gutters, where any increase of the total impervious surface area of the facility is de minimis. This provision does not include critical actions, levee systems, chemical storage facilities (including any tanks), wastewater facilities, or sewer lagoons.

Continue to Question 8, Mitigation

☐ 8-Step Process applies.
Provide a completed 8-Step Process, including the early public notice and the final notice.

Continue to Question 8, Mitigation

8. Mitigation

For the project to comply with this section, all adverse impacts must be mitigated. Explain in detail the measures that must be implemented to mitigate the impact or effect, including the timeline for implementation. Note: newly constructed and substantially improved structures within the FFRMS floodplain must be elevated to the FFRMS floodplain elevation or floodproofed, if applicable.

Which of the following if any mitigation/minimization measures have been identified for this project in the 8-Step or 5-Step Process? Select all that apply.

☐ Buyout and demolition or other supported clearance of floodplain structures

☐ Insurance purchased in excess of statutory requirement under the Flood Disaster Protection Act of 1973

☐ Permeable surfaces

☐ Natural landscape enhancements that maintain or restore natural hydrology

☐ Planting or restoring native plant species

☐ Bioswales

☐ Stormwater capture and reuse

☐ Green or vegetative roofs with drainage provisions

☐ Natural Resources Conservation Service conservation easements or similar easements

☐ Floodproofing of structures as allowable (e.g. non-residential floors)

☐ Elevating structures (including freeboarding above the required base flood elevations)

☐ Levee or structural protection from flooding

☐ Channelizing or redefining the floodway or floodplain through a Letter of Map Revision (LOMR)

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- FIRM panel numbers
- CISA data or maps
- Information on other data or tools used or accessed
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

According to FEMA Flood Insurance Rate Map (FIRM) #39061C-0233E, dated February 17, 2010, the subject property is located in Unshaded Zone X, designated as an area outside the 100- and 500-year floodplain. According to the FEMA Flood Map Service Center accessed at https://msc.fema.gov/portal/home, there are no preliminary or pending FIRMs for the subject property.

In order to determine the Federal Flood Risk Management Standard (FFRMS) floodplain for this project, the nearest flooding sources were evaluated to identify whether the associated 500-year floodplain has been mapped/defined by FEMA, thus allowing the project to utilize the 0.2% Annual Chance Flood Approach (0.2PFA). The nearest flooding source is the Section Road Creek approximately 1.2 miles to the west for which the 500-year floodplain has been mapped/defined, according to the FEMA FIRM. Therefore, the extent of the FFRMS floodplain via 0.2PFA corresponds to the mapped/defined 500-year floodplain, which does not extend anywhere near the subject property.

Therefore, no mitigation is required and the property is in compliance with HUD's Floodplain Management regulations.

Include all documentation supporting your findings in your submission to HUD

Are formal compliance steps or mitigation required?

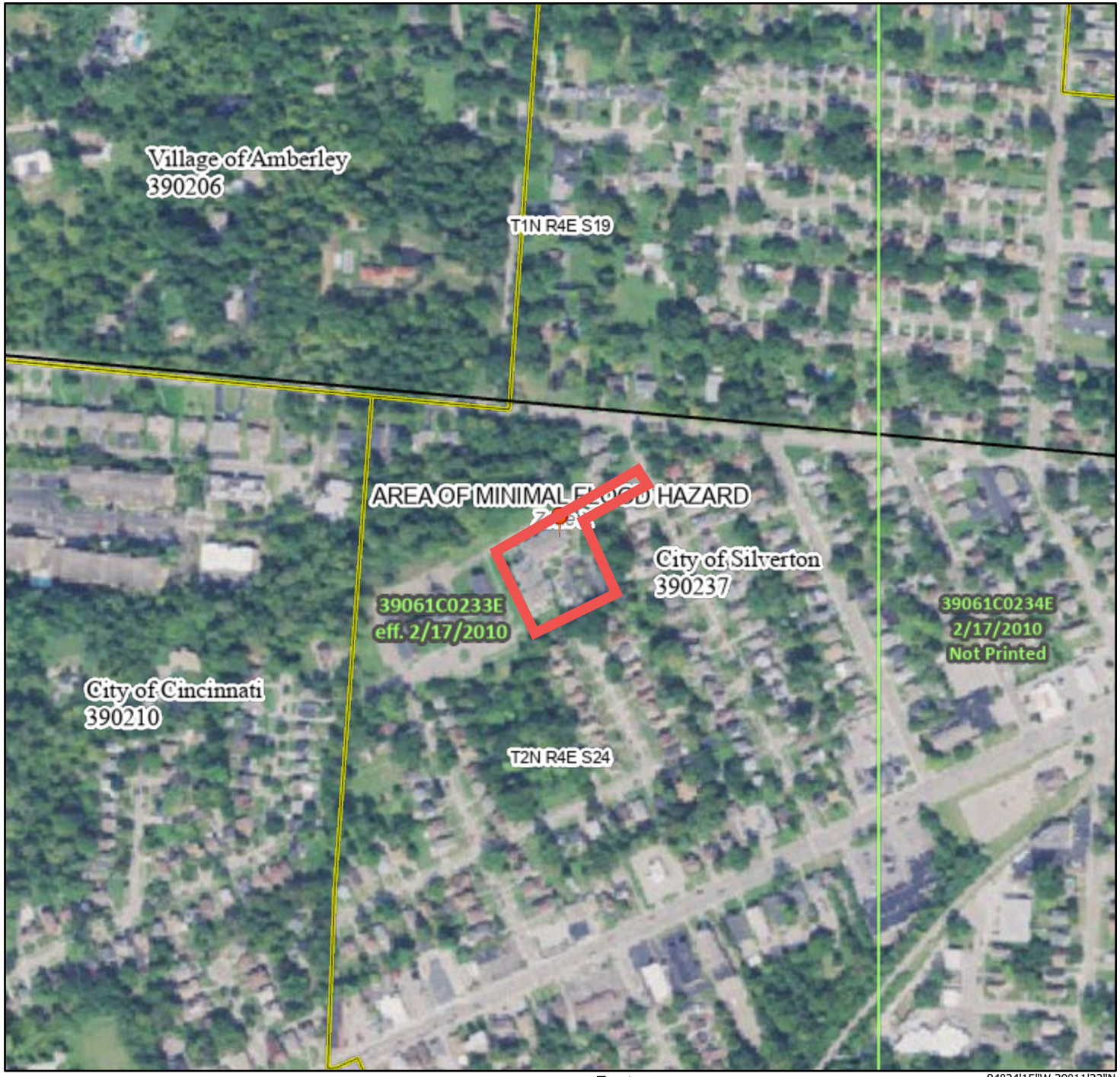
☐ Yes

☑ No

National Flood Hazard Layer FIRMette

FEMA

84°24'52"W 39°11'50"N



84°24'15"W 39°11'22"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/24/2025 at 7:15 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

The subject property firm number is not listed

"

FEMA (//www.fema.gov/)

Navigation

Search

MSC Home (/portal/)

MSC Search by Address (/portal/search)

MSC Search All Products (/portal/advanceSearch)

MSC Products and Tools (/portal/resources/productsandtools)

Hazus (/portal/resources/hazus)

LOMC Batch Files (/portal/resources/lomc)

Product Availability (/portal/productAvailability)

MSC Frequently Asked Questions (FAQs) (/portal/resources/faq)

MSC Email Subscriptions (/portal/subscriptionHome)

Contact MSC Help (/portal/resources/contact)

FEMA Flood Map Service Center: Search All Products

Choose one of the three search options below and optionally enter a posting date range.

Jurisdiction

State

-- Select --

Jurisdiction Name

Jurisdiction Name or FEMA ID

SILVERTON, CITY OF

(Ex. Fairfax County-wide or 51059C)

Product ID

Product ID

(Ex. Panel Number, LOMC Case Number)

Filter By Posting Date Range *(Optional)*

Search | Clear All Fields

Search Results for SILVERTON, CITY OF

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Click to download a listing of all products.

If you are a person with a disability, are blind, or have low vision, and need assistance, please contact a map specialist (https://msc.fema.gov/portal/resources/contact).

Please Note: Searching All Products by county displays all products for all communities within the county. You can refine your search results by specifying your specific jurisdiction location using the drop-down menus above.

Expand All

Effective Products (9)

Preliminary Products (3)

Please note: Preliminary data are for review and guidance purposes only. By viewing preliminary data and maps, the user acknowledges that the information provided is preliminary and subject to change. Preliminary data, including new or revised FIRMs, FIS reports, and FIRM Databases, are not final and are presented on the MSC as the best information available at this time. Additionally, preliminary data cannot be used to rate flood insurance policies or enforce the Federal mandatory purchase requirement. FEMA will remove preliminary data once effective data are available.

Preliminary FIRM Panels (3) DL ALL

Please note: Searches often result in many map files listed under a given section. You can determine the Product ID for the individual map panel needed by looking at the Map Index file. The index map files have "IND" within the Product ID and appear at the start of the list. These index files show an overview of a jurisdiction and how it is subdivided into map panels with the Product ID for each panel shown.

Show 100 **entries**

Showing 1 to 3 of 3 entries

Previous 1 Next

Product ID	Issue Date	Size	Download
39061CIND1B	03/05/2021	1 MB	DL (/portal/downloadProduct?productTypeID=PRELIM_PRODUCT&productSubTypeID=PRELIM_FIRM_INDEX&p
39061CIND1G	02/03/2023	2 MB	DL (/portal/downloadProduct?productTypeID=PRELIM_PRODUCT&productSubTypeID=PRELIM_FIRM_INDEX&p
39061CIND2B	03/05/2021	1 MB	DL (/portal/downloadProduct?productTypeID=PRELIM_PRODUCT&productSubTypeID=PRELIM_FIRM_INDEX&p

Preliminary FIS Reports (0)

Preliminary FIRM Database (0)

Pending Product (0)

Historic Products (19)

Flood Risk Products (0)

Share This Page.

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Ohio State Plane South zone 5001 (FIPSZONE 3402). The **horizontal datum** was NAD83. Differences in datum, spheroid, projection or state plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Cincinnati Geographic Information Systems (CAGIS), United States Geologic Survey, and National Geodetic Survey. Additional information was photogrammetrically compiled at a scale of 1:12,000 from aerial photography dated 2001.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

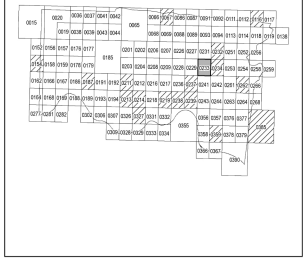
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

The **Profile Baseline** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **Profile Baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

PANEL INDEX



Panel Not Printed

Subject Property

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100 year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard may include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside of the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 10)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 - - - - - 23	Transect line
85° 03' 45.0", 41° 24' 22.5"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4587000 M	1000-meter Universal Transverse Mercator grid values, zone 16
2250000 FT	5000-foot grid ticks: Ohio State Plane South Coordinate System, 5001 zone (FIPSZONE 3402) Lambert Conformal Conic projection
KA0015 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
May 17, 2004

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 17, 2010 - to update corporate limits, to change Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0233E

FIRM
FLOOD INSURANCE RATE MAP
HAMILTON COUNTY, OHIO
AND INCORPORATED AREAS

PANEL 233 OF 390

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

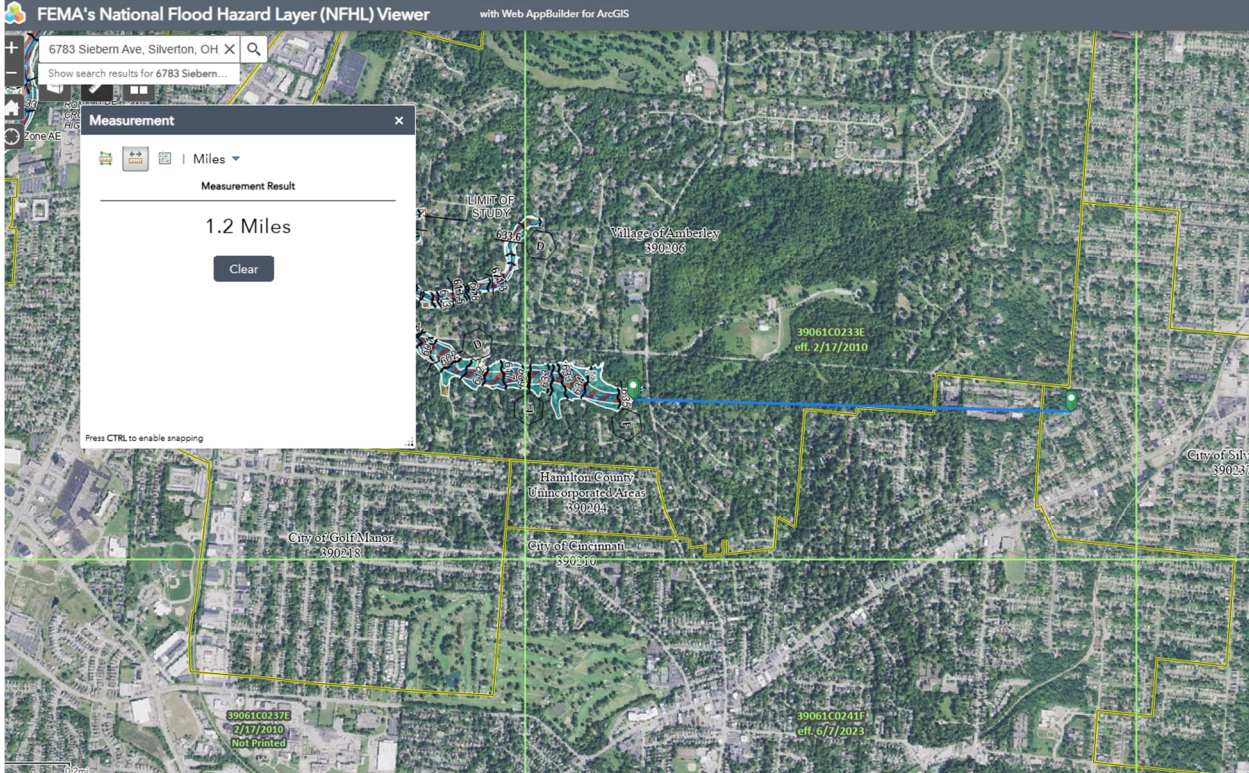
COMMUNITY	NUMBER	PANEL	SUFFIX
AMBERLEY, VILLAGE OF	390206	0233	E
CINCINNATI, CITY OF	390210	0233	E
DEER PARK, CITY OF	390212	0233	E
HAMILTON COUNTY	390204	0233	E
READING, CITY OF	390234	0233	E
SILVERTON, CITY OF	390237	0233	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
39061C0233E

MAP REVISED
FEBRUARY 17, 2010

Federal Emergency Management Agency


FEMA's National Flood Hazard Layer (NFHL) Viewer
with Web AppBuilder for ArcGIS
6783 Siebern Ave, Silverton, OH
Show search results for 6783 Siebern...
Measurement
Miles
Measurement Result
1.2 Miles
Clear
Press CTRL to enable snapping
Zone AE
LIMIT OF STUDY
Village of Amberley
390206
39061C0233E
eff. 2/17/2010
Hamilton County
Unincorporated Areas
390204
City of Golf Manor
390218
City of Cincinnati
390210
39061C0237E
2/17/2010
Not Printed
39061C0241F
eff. 6/7/2023

Appendix M:

Historic Preservation

Historic Preservation (CEST and EA)

General requirements	Legislation	Regulation
Regulations under Section 106 of the National Historic Preservation Act (NHPA) require a consultative process to identify historic properties, assess project impacts on them, and avoid, minimize, or mitigate adverse effects	Section 106 of the National Historic Preservation Act (16 U.S.C. 470f)	36 CFR 800 "Protection of Historic Properties"
Reference		
https://www.hudexchange.info/environmental-review/historic-preservation		

Threshold

Is Section 106 review required for your project?

☐ No, because the project consists solely of activities listed as exempt in a Programmatic Agreement (PA). (See the PA Database to find applicable PAs.)

Either provide the PA itself or a link to it here. Mark the applicable exemptions or include the text here:

→ *Continue to the Worksheet Summary.*

☐ No, because the project consists solely of activities included in a No Potential to Cause Effects memo or other determination [36 CFR 800.3(a)(1)].

Either provide the memo itself or a link to it here. Explain and justify the other determination here:

→ *Continue to the Worksheet Summary.*

☑ Yes, because the project includes activities with potential to cause effects (direct or indirect). → *Continue to Step 1.*

The Section 106 Process

After determining the need to do a Section 106 review, initiate consultation with regulatory and other interested parties, identify and evaluate historic properties, assess effects of the project on properties listed on or eligible for the National Register of Historic Places, and resolve any adverse effects through project design modifications or mitigation.

Note that consultation continues through all phases of the review.

Step 1: Initiate consultation

Step 2: Identify and evaluate historic properties

Step 3: Assess effects of the project on historic properties

Step 4: Resolve any adverse effects

Step 1 - Initiate Consultation

The following parties are entitled to participate in Section 106 reviews: Advisory Council on Historic Preservation; State Historic Preservation Officers (SHPOs); federally recognized Indian tribes/Tribal Historic Preservation Officers (THPOs); Native Hawaiian Organizations (NHOs); local governments; and project grantees. The general public and individuals and organizations with a demonstrated interest in a project may participate as consulting parties at the discretion of the RE or HUD official. Participation varies with the nature and scope of a project. Refer to HUD's website for guidance on consultation, including the required timeframes for response. Consultation should begin early to enable full consideration of preservation options.

Use the When To Consult With Tribes checklist within Notice CPD-12-006: Process for Tribal Consultation to determine if you should invite tribes to consult on a particular project. Use the Tribal Directory Assessment Tool (TDAT) to identify tribes that may have an interest in the area where the project is located. Note that consultants may not initiate consultation with Tribes.

Select all consulting parties below (check all that apply):

- ☑ State Historic Preservation Officer (SHPO)
- ☐ Advisory Council on Historic Preservation
- ☑ Indian Tribes, including Tribal Historic Preservation Officers (THPOs) or Native
- ☐ Hawaiian Organizations (NHOs)

  List all tribes that were consulted here and their status of consultation:
  It is the responsibility of HUD to contact any applicable Tribal Historic Preservation Officers (THPO) of any affected tribes, as applicable. D3G has prepared letters for HUD's use in consulting with the THPOs.

- ☐ Other Consulting Parties

  List all consulting parties that were consulted here and their status of consultation:

Describe the process of selecting consulting parties and initiating consultation here:

Federal undertakings require HUD to make a determination of no effect, no adverse effect, or adverse effect upon historic properties. To assist HUD in making its historic preservation determination, D3G submitted a package of supporting information to the appropriate State Historic Preservation Officer (SHPO) for their review. It is the responsibility of HUD to contact any applicable Tribal Historic Preservation Officers (THPO) of any affected tribes, as applicable. D3G has prepared letters for HUD's use in consulting with the THPOs.

Provide all correspondence, notices, and notes (including comments and objections received) and continue to Step 2.

Step 2 - Identify and Evaluate Historic Properties

Define the Area of Potential Effect (APE), either by entering the address(es) or providing a map depicting the APE. Attach an additional page if necessary.

The Direct Area of Potential Effects (APE) includes only the subject property, while the Indirect (Visual) APE includes any vicinity properties within an approximate 0.10-mile view-shed to the subject property, as delineated on the attached map.

Gather information about known historic properties in the APE. Historic buildings, districts and archeological sites may have been identified in local, state, and national surveys and registers, local historic districts, municipal plans, town and county histories, and local history websites. If not already listed on the National Register of Historic Places, identified properties are then evaluated to see if they are eligible for the National Register. Refer

to HUD's website for guidance on identifying and evaluating historic properties.

In the space below, list historic properties identified and evaluated in the APE.

Every historic property that may be affected by the project should be listed. For each historic property or district, include the National Register status, whether the SHPO has concurred with the finding, and whether information on the site is sensitive. Attach an additional page if necessary.

Numerous structures located within the indirect (visual) APE are listed as locally historic resources; however, given the modern age of the subject property structure, the proposed undertaking is anticipated to have No Effect on these resources.

Provide the documentation (survey forms, Register nominations, concurrence(s) and/or objection(s), notes, and photos) that justify your National Register Status determination.

Was a survey of historic buildings and/or archeological sites done as part of the project?

If the APE contains previously unsurveyed buildings or structures over 50 years old, or there is a likely presence of previously unsurveyed archeological sites, a survey may be necessary. For Archeological surveys, refer to HP Fact Sheet #6, Guidance on Archeological Investigations in HUD Projects.

☐ Yes *Provide survey(s) and report(s) and continue to Step 3.*
Additional notes:

☑ No *Continue to Step 3.*

Step 3 - Assess Effects of the Project on Historic Properties

Only properties that are listed on or eligible for the National Register of Historic Places receive further consideration under Section 106. Assess the effect(s) of the project by applying the Criteria of Adverse Effect. (36 CFR 800.5)] Consider direct and indirect effects as applicable as per HUD guidance.

Choose one of the findings below - No Historic Properties Affected, No Adverse Effect, or Adverse Effect; and seek concurrence from consulting parties.

☑ No Historic Properties Affected

Document reason for finding:

☐ No historic properties present. → *Provide concurrence(s) or objection(s) and continue to the Worksheet Summary.*

☑ Historic properties present, but project will have no effect upon them. → *Provide concurrence(s) or objection(s) and continue to the Worksheet Summary.*

If consulting parties concur or fail to respond to user's request for concurrence, project is in compliance with this section. No further review is required. If consulting parties object, refer to (36 CFR 800.4(d)(1)) and consult further to try to resolve objection(s).

☐ No Adverse Effect

Document reason for finding:

Does the No Adverse Effect finding contain conditions?

☐ Yes

Check all that apply: (check all that apply)

☐ Avoidance

☐ Modification of project

☐ Other

Describe conditions here:

→ *Monitor satisfactory implementation of conditions. Provide concurrence(s) or objection(s) and continue to the Worksheet Summary.*

☐ No → *Provide concurrence(s) or objection(s) and continue to the Worksheet Summary.*

If consulting parties concur or fail to respond to user's request for concurrence, project is in compliance with this section. No further review is required. If consulting parties object, refer to (36 CFR 800.5(c)(2)) and consult further to try to resolve objection(s).

☐ Adverse Effect

Document reason for finding:

Copy and paste applicable Criteria into text box with summary and justification. Criteria of Adverse Effect: 36 CFR 800.5]

Notify the Advisory Council on Historic Preservation of the Adverse Effect and provide the documentation outlined in 36 CFR 800.11(e). The Council has 15 days to decide whether to enter the consultation (Not required for projects covered by a Programmatic Agreement).

→ Continue to Step 4.

Step 4 - Resolve Adverse Effects

Work with consulting parties to try to avoid, minimize or mitigate adverse effects. Refer to HUD guidance and 36 CFR 800.6 and 800.7.

Were the Adverse Effects resolved?

☐ Yes

Describe the resolution of Adverse Effects, including consultation efforts and participation by the Advisory Council on Historic Preservation:

For the project to be brought into compliance with this section, all adverse impacts must be mitigated. Explain in detail the exact measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.

→ *Provide signed Memorandum of Agreement (MOA) or Standard Mitigation Measures Agreement (SMMA). Continue to the Worksheet Summary.*

☐ No

The project must be cancelled unless the "Head of Agency" approves it. Either provide approval from the "Head of Agency" or cancel the project at this location.

Describe the failure to resolve Adverse Effects, including consultation efforts and participation by the Advisory Council on Historic Preservation and "Head of the Agency":

Explain in detail the exact conditions or measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.

→ *Provide correspondence, comments, documentation of decision, and "Head of Agency" approval. Continue to the Worksheet Summary.*

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

The subject property consists of one (1) three-story age-restricted apartment structures constructed in 1996. The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex.

A review of the National Register of Historic Places and the Ohio History Connection Map, accessed at https://www.ohiohistory.org/preserve/state-historic-preservation-office/mapping, indicates that the subject property structure is not listed on the National Register of Historic Places; is not located within, or adjacent to, a Historic District; and is not listed as a local landmark. Numerous structures located within the indirect (visual) APE are listed as locally historic resources; however, given the modern age of the subject property structure, the proposed undertaking is anticipated to have No Effect on these resources. Based on the date of construction (1996), the subject property structure is not suspected to be eligible for listing on the National Register.

D3G prepared letters for HUD’s consultations with the Tribal Historic Preservation Officers (THPOs) of the following tribes: Eastern Shawnee Tribe of Oklahoma, Miami Tribe of Oklahoma, Osage Nation, and Seneca-Cayuga Nation. No objections to the proposed undertaking are anticipated.

Based on the foregoing information, Dominion Due Diligence Group (D3G) proposes the following final determination of effects: There will be no historic properties or cultural resources affected by the proposed undertaking.

To assist HUD in making its historic preservation determination, D3G submitted a package of supporting information to the appropriate State Historic Preservation Officer (SHPO) for their review. According to a response dated October 21, 2025, the Ohio SHPO confirmed that there will be no historic properties affected by the proposed undertaking. It is the responsibility of HUD to contact any applicable Tribal Historic Preservation Officers (THPO) of any affected tribes, as applicable. D3G has prepared letters for HUD's use in consulting with the THPOs.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

October 7, 2025

Ohio Historic Preservation Office
Attn: Resource Protection and Review
800 E. 17th Ave
Columbus, Ohio 43211-2497

Subject: SHPO Determination of Effects
St. Theresa Village
6783 Siebern Avenue
Silverton, Ohio 45236
Parcel ID #: 602-0001-0059-00 (2.171 AC) & 060200010432 (1.3 AC)
Latitude: 39.1933, Longitude: -84.409465

This letter is to provide the necessary information and supporting documentation for this determination of effects with respect to historical and cultural properties known to be within the undertaking's area of potential effects.

FUNDING PROGRAM:
HUD Rental Assistance Demonstration (RAD) – Rehabilitation of the existing age-restricted apartment complex
Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC)

LENDER CONTACT INFORMATION
National Church Residences
Attn: Aubrey Pyle, Project Coordinator
2245 North Bank Drive
Columbus, OH 43220
apyle@nationalchurchresidences.org

AUTHORIZED REPRESENTATIVE CONTACT INFORMATION
Dominion Due Diligence Group
Attn: Kristina Harvey, NEPA Specialist
201 Wylderose Drive
Midlothian, Virginia 23113
k.harvey@d3g.com

PRESENT CONDITION OF THE SITE:
The subject property consists of one (1) three-story age-restricted apartment structures constructed in 1996. The subject property structures contain a total of fifty (50) age-restricted residential dwelling units and are situated on approximately 2.171 acres of land. The subject property contains a gross building area of approximately 42,192 square feet. Located within the apartment structure are laundry facilities, a leasing office, maintenance areas, a mail kiosk, a wellness center, a community kitchen and dining area, and storage areas. Exterior property improvements include a maintenance shed, landscaped regions, and asphalt parking areas. The subject property is serviced by electricity, natural gas, and municipally supplied water and sewer.

AREA OF POTENTIAL EFFECT:

The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex. Proposed interior repairs consist of the addition of audio/visual alarms, insulation, a fitness room, rent drop box, trash chute, garbage disposals, as well as sprinkler heads; hardware, threshold, and apartment feature adjustments to comply with federal accessibility standards as well as one (1) 2 bedroom unit to an office suite; the repainting of all walls/ceilings; the reconfiguration of one (1) unit to a handicap accessible unit; the replacement of the interior signage, common area furniture, gas fired water heaters, HVAC equipment, elevator cab finishes, fire extinguishers, fire arm control panels, flooring, mail boxes, doors, appliances, bathroom accessories, countertops, plumbing fixtures, shelving, baseboards, window sills, window jamb extensions, hand/chair rails, lighting, automatic door openers, window treatments, ACT ceiling tiles, common area kitchen cabinets/countertops, stair treads, wall/ceiling finishes, and camera system; and the relocation of the community kitchen to the a larger community space. Proposed exterior repairs consist of the addition of vertical signage at the handicap parking spaces, an accessible route to the dumpster enclosures, bollards at the rear of the property, and positive drainage away from buildings; the repainting of the lintels; the tuckpointing of the brick veneer; the milling and overlaying of the existing parking lot; the replacement of the dumpster enclosures, property signage, windows, EPDM roofing, soffits/fascia, gutters/downspouts, doors, siding, exhaust vent covers, lighting, balcony guard rails, as well as the wood decking; and landscaping. The Direct Area of Potential Effects (APE) includes only the subject property, as no off-site ground disturbance is proposed. The Indirect APE includes any vicinity properties within an approximate 0.10-mile view-shed to the subject property, as delineated on the attached map.

APE HISTORY:

According to the reviewed subject property historical information, the subject property consisted of vacant land and a private drive in 1937, undeveloped wooded and grassland with a garden path associated with the western adjacent vacant, former St. Theresa's Care Home from at least 1938 until construction of the current subject property structure in 1996. Vicinity structures within the APE date to at least the 1930s.

REVIEW OF HISTORIC LISTINGS:

A review of the National Register of Historic Places and the Ohio History Connection Map, accessed at https://www.ohiohistory.org/preserve/state-historic-preservation-office/mapping, indicates that the subject property structure is not listed on the National Register of Historic Places; is not located within, or adjacent to, a Historic District; and is not listed as a local landmark. Numerous structures located within the indirect (visual) APE are listed as locally historic resources; however, given the modern age of the subject property structure, the proposed undertaking is anticipated to have No Effect on these resources. Based on the date of construction (1996), the subject property structure is not suspected to be eligible for listing on the National Register.

D3G prepared letters for HUD's consultations with the Tribal Historic Preservation Officers (THPOs) of the following tribes: Eastern Shawnee Tribe of Oklahoma, Miami Tribe of Oklahoma, Osage Nation, and Seneca-Cayuga Nation. No objections to the proposed undertaking are anticipated.

Based on the foregoing information, Dominion Due Diligence Group (D3G) proposes the following final determination of effects: *There will be no historic properties or cultural resources affected by the proposed undertaking.*

Your review and response to this determination of effects will be appreciated to complete the Section 106 Review. Please feel free to contact D3G should you need any additional information to issue your response.

Sincerely;

DOMINION DUE DILIGENCE GROUP

Kristina Harvey
NEPA Specialist
k.harvey@d3g.com

Samantha W. Alfonso
NEPA Compliance Manager
s.alfonso@d3g.com

OHIO HISTORICAL SOCIETY
Ohio Historic Preservation Office

OHIO HISTORIC PRESERVATION OFFICE: RESOURCE PROTECTION AND REVIEW

Section 106 Review - Project Summary Form

For projects requiring a license from the Federal Communications Commission, please use FCC Forms 620 or 621. DO NOT USE THIS FORM.

SECTION 1: GENERAL PROJECT INFORMATION

All contact information provided must include the name, address and phone number of the person listed. Email addresses should also be included, if available. Please refer to the Instructions or contact an OHPO reviewer (mailto:Section106@ohiohistory.org) if you need help completing this Form. Unless otherwise requested, we will contact the person submitting this Form with questions or comments about this project.

Date: October 7, 2025

Name/Affiliation of person submitting form: Kristina Harvey, Dominion Due Diligence Group (Authorized Representative for HUD)

Mailing Address: 201 Wylderose Drive, Midlothian, VA. 23113

Phone/Fax/Email: 757-751-7624, k.harvey@d3g.com

A. Project Info:

1. This Form provides information about:
   New Project Submittal:
   YES NO

   Additional information relating to previously submitted project:
   YES NO

   OHPO/RPR Serial Number from previous submission:

2. Project Name (if applicable): St. Theresa Village

3. Internal tracking or reference number used by Federal Agency, consultant, and/or applicant to identify this project (if applicable): 2025-1881

B. Project Address or vicinity: 6783 Siebern Avenue

C. City/Township: Silverton

D. County: Hamilton County

E. Federal Agency and Agency Contact. *If you do not know the federal agency involved in your project, please contact the party asking you to apply for Section 106 Review, not OHPO, for this information. HUD Entitlement Communities acting under delegated environmental review authority should list their own contact information.*

US Department of Housing and Urban Development (HUD)

Dominion Due Diligence Group (D3G) is submitting on behalf of the federal agency

F. Type of Federal Assistance. *List all known federal sources of federal funding, approvals, and permits to avoid repeated reviews.*

HUD Rental Assistance Demonstration (RAD) – Rehabilitation of the existing age-restricted apartment complex

Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC)

G. State Agency and Contact Person (if applicable):

Not Applicable

H. Type of State Assistance:

I. Is this project being submitted at the direction of a state agency **solely** under Ohio Revised Code 149.53 or at the direction of a State Agency? *Answering yes to this question means that you are sure that no federal funding, permits or approvals will be used for any part of your project, and that you are seeking comments only under ORC 149.53.*

YES NO

J. Public Involvement- Describe how the public has been/will be informed about this project and its potential to affect historic properties. Please summarize how they will have an opportunity to provide comments about any effects to historic properties. (This step is required for all projects under 36 CFR § 800.2):

Not Applicable – Refinance of a non-historic structure

K. Please list other consulting parties that you have contacted/will contact about this project, such as Indian Tribes, Certified Local Governments, local officials, property owners, or preservation groups. (See 36 CFR § 800.2 for more information about involving other consulting parties). Please summarize how they will have an opportunity to provide comments:

D3G prepared letters for HUD's consultations with the Tribal Historic Preservation Officers (THPOs) of the following tribes: Eastern Shawnee Tribe of Oklahoma, Miami Tribe of Oklahoma, Osage Nation, and Seneca-Cayuga Nation. No objections to the proposed undertaking are anticipated.

SECTION 2: PROJECT DESCRIPTION AND AREA OF POTENTIAL EFFECTS (APE)

Provide a description of your project, its site, and geographical information. You will also describe your project's Area of Potential Effects (APE). Please refer to the Instructions or contact an OHPO reviewer if you need help with developing the APE or completing this form.

For challenging projects, provide as much information as possible in all sections, and then check the box in Section 5.A. to ask OHPO to offer preliminary comments or make recommendations about how to proceed with your project consultation. This is recommended if your project involves effects to significant historic properties or if there may be challenging procedural issues related to your project. Please note that providing information to complete all Sections will still be required and that asking OHPO for preliminary comments may tend to delay completion of the review process for some projects.

A. Does this project involve any Ground-Disturbing activity: YES NO
(If **Yes**, you must complete all of Section 2.A. If **No**, proceed directly to Section 2. B.)

1. General description of width, length and depth of proposed ground disturbing activity: Milling of the existing parking lot, addition of an accessible route, and grading to provide positive drainage away from the buildings.

2. Narrative description of previous land use and past ground disturbances, if known: According to the reviewed subject property historical information, the subject property consisted of vacant land and a private drive in 1937, undeveloped wooded and grassland with a garden path associated with the western adjacent vacant, former St. Theresa's Care Home from at least 1938 until construction of the current subject property structure in 1996.

3. Narrative description of current land use and conditions: The subject property consists of one (1) three-story age-restricted apartment structures constructed in 1996.

4. Does the landowner know of any archaeological resources found on the property?
YES NO If yes, please describe:

B. Submit the exact project site location on a USGS 7.5-minute topographic quadrangle map for all projects. Map sections, photocopies of map sections, and online versions of USGS maps are acceptable as long as the location is clearly marked. Show the project's Area of Potential Effects (APE). It should be clearly distinguished from other features shown on the map:

1. USGS Quad Map Name: East Cincinnati, Ohio 2023

2. Township/City/Village Name: Silverton, Hamilton County

C. Provide a street-level map indicating the location of the project site; road names must be identified and legible. Your map must show the exact location of the boundaries for the project site. Show the project's Area of Potential Effects (APE). It should be clearly distinguished from other features shown on the map: Attached.

D. Provide a verbal description of the APE, including a discussion of how the APE will include areas with the potential for direct and indirect effects from the project. Explain the steps taken to identify the project's APE, and your justification for the specific boundaries chosen:

The Direct Area of Potential Effects (APE) includes only the subject property, as no off-site ground disturbance is proposed. The Indirect APE includes any vicinity properties within an approximate 0.10-mile view-shed to the subject property, as delineated on the attached map.

E. Provide a detailed description of the project. This is a critical part of your submission. Your description should be prepared for a cold reader who may not be an expert in this type of project. The information provided must help support your analysis of effects to historic properties, not other types of project impacts. Do not simply include copies of environmental documents or other types of specialized project reports. If there are multiple project alternatives, you should include information about all alternatives. The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex. Proposed interior repairs consist of the addition of audio/visual alarms, insulation, a fitness room, rent drop box, trash chute, garbage disposals, as well as sprinkler heads; hardware, threshold, and apartment feature adjustments to comply with federal accessibility standards as well as one (1) 2 bedroom unit to an office suite; the repainting of all walls/ceilings; the reconfiguration of one (1) unit to a handicap accessible unit; the replacement of the interior signage, common area furniture, gas fired water heaters, HVAC equipment, elevator cab finishes, fire extinguishers, fire arm control panels, flooring, mail boxes, doors, appliances, bathroom accessories, countertops, plumbing fixtures, shelving, baseboards, window sills, window jamb extensions, hand/chair rails, lighting, automatic door openers, window treatments, ACT ceiling tiles, common area kitchen cabinets/countertops, stair treads, wall/ceiling finishes, and camera system; and the relocation of the community kitchen to the a larger community space. Proposed exterior repairs consist of the addition of vertical signage at the handicap parking spaces, an accessible route to the dumpster enclosures, bollards at the rear of the property, and positive drainage away from buildings; the repainting of the lintels; the tuckpointing of the brick veneer; the milling and overlaying of the existing parking lot; the replacement of the dumpster enclosures, property signage, windows, EPDM roofing, soffits/fascia, gutters/downspouts, doors, siding, exhaust vent covers, lighting, balcony guard rails, as well as the wood decking; and landscaping.

SECTION 3: IDENTIFICATION OF HISTORIC PROPERTIES

Describe whether there are historic properties located within your project APE. To make that determination, use information generated from your own Background Research and Field Survey. Then choose one of the following options to report your findings. Please refer to the Instructions and/or contact an OHPO reviewer if you are unsure about how to identify historic properties for your project.

If you read the Instructions and you're still confused as to which reporting option best fits your project, or you are not sure if your project needs a survey, you may choose to skip this section, but provide as much supporting documentation as possible in all other Sections, then check the box in Section 5.A. to request preliminary comments from OHPO. After reviewing the information provided, OHPO will then offer comments as to which reporting option is best suited to document historic properties for your project. Please note that providing information to complete this Section will still be required and that asking OHPO for preliminary comments may tend to delay completion of the review process for some projects.

Recording the Results of Background Research and Field Survey:

A. **Summary of discussions and/or consultation with OHPO** about this project that demonstrates how the Agency Official and OHPO have agreed that no Field Survey was necessary for this project (typically due to extreme ground disturbance or other special circumstances). Please **attach copies** of emails/correspondence that document this

agreement. You must explain how the project's potential to affect both archaeological and historic resources were considered.

B. **A table that includes the minimum information** listed in the OHPO Section 106 Documentation Table (which is generally equivalent to the information found on an inventory form). This information must be printed and mailed with the Project Summary Form. To provide sufficient information to complete this Section, you must also include summary observations from your field survey, background research and eligibility determinations for each property that was evaluated in the project APE.

C. **OHI (Ohio Historic Inventory) or OAI (Ohio Archaeological Inventory) forms**- New or updated inventory forms may be prepared using the OHI pdf form with data population capabilities, the Internet IForm, or typed on archival quality inventory forms. To provide sufficient information to complete this Section, you must include summary observations from your field survey and background research. You must also include eligibility determinations for each property that was evaluated in the project APE

D. **A historic or archaeological survey report** prepared by a qualified consultant that meets professional standards. The survey report should meet the Secretary of the Interior's Standards and Guidelines for Identification and OHPO Archaeological Guidelines. You may also include new inventory forms with your survey, or update previous inventory forms. To complete this section, your survey report must include summary observations from your field survey, background research and eligibility determinations for each property that was evaluated within the APE.

E. **Project Findings**. Based on the conclusions you reached in completing Section 3, please choose one finding for your project. There are (mark one):

Historic Properties Present in the APE

Numerous structures located within the indirect (visual) APE are listed as locally historic resources; however, given the modern age of the subject property structure, the proposed undertaking is anticipated to have No Effect on these resources.

SECTION 4: SUPPORTING DOCUMENTATION

This information must be provided for all projects.

A. Photographs must be keyed to a street-level map, and should be included as attachments to this application. Please label all forms, tables and CDs with the date of your submission and project name, as identified in Section 1. You must present enough documentation to clearly show existing conditions at your project site and convey details about the buildings, structures or sites that are described in your submission. Faxed or photocopied photographs are not acceptable. See Instructions for more info about photo submissions or 36 CFR § 800.11 for federal documentation standards.
   1. Provide photos of the entire project site and take photos to/from historic properties from/towards your project site to support your determination of effect in Section 5.
   2. Provide current photos of all buildings/structures/sites described.

B. Project plan, specifications, site drawings and any other media presentation that conveys detailed information about your project and its potential to affect historic properties.

C. Copies or summaries of any comments provided by consulting parties or the public.

SECTION 5: DETERMINATION OF EFFECT

A. **Request Preliminary Comments.** For challenging projects, provide as much information as possible in previous sections and ask OHPO to offer preliminary comments or make recommendations about how to proceed with your project

consultation. This is recommended if your project involves effects to significant historic properties, if the public has concerns about your project's potential to affect historic properties, or if there may be challenging procedural issues related to your project. Please be aware that providing information in all Sections will still be required and that asking OHPO for preliminary comments may tend to delay completion of the review process for some projects.

1. We request preliminary comments from OHPO about this project:
   YES NO

2. Please specify as clearly as possible the particular issues that you would like OHPO to examine for your project (for example- help with developing an APE, addressing the concerns of consulting parties, survey methodology, etc.):

B. **Determination of Effect.** If you believe that you have gathered enough information to conclude the Section 106 process, you may be ready to make a determination of effect and ask OHPO for concurrence, while considering public comments. Please select and mark one of the following determinations, then explain the basis for your decision on an attached sheet of paper:

No historic properties will be affected based on 36 CFR § 800.4(d) (1). Please explain how you made this determination: A review of the National Register of Historic Places and the Ohio History Connection Map, accessed at https://www.ohiohistory.org/preserve/state-historic-preservation-office/mapping, indicates that the subject property structure is not listed on the National Register of Historic Places; is not located within, or adjacent to, a Historic District; and is not listed as a local landmark. Numerous structures located within the indirect (visual) APE are listed as locally historic resources; however, given the modern age of the subject property structure, the proposed undertaking is anticipated to have No Effect on these resources. Based on the date of construction (1996), the subject property structure is not suspected to be eligible for listing on the National Register.

No Adverse Effect [36 CFR § 800.5(b)] on historic properties. This finding cannot be used if there are no historic properties present in your project APE. Please explain why the Criteria of Adverse Effect, [36 CFR Part 800.5(a) (1)], were found not to be applicable for your project:

Adverse Effect [36 CFR § 800.5(d) (2)] on historic properties. Please explain why the criteria of adverse effect, [36 CFR Part 800.5(a) (1)], were found to be applicable to your project. You may also include an explanation of how these adverse effects might be avoided, reduced or mitigated:

Please print and mail completed form and supporting documentation to:

Ohio Historic Preservation Office
Attn: Resource Protection and Review Department Head
Resource Protection and Review
800 E. 17th Avenue
Columbus, OH 43211-2497

National Register of Historic Places

September 24, 2025

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Project 1

National Register of Historic Places

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Maxar, EPA OEI, OFA

Ohio History Connection

Legend

SHPO Determinations

Archaeology Determinations

Historic Determinations

Determination Boundaries

Historic Inventory

Archaeological Inventory

Archaeological Inventory

OAI Boundaries

OAI Form Under Review

Survey123 Data

OAI Submissions

OAI Entry Form

OHI Submissions

Surveyed Areas

Previously Surveyed Areas

Historic Surveys

Notes

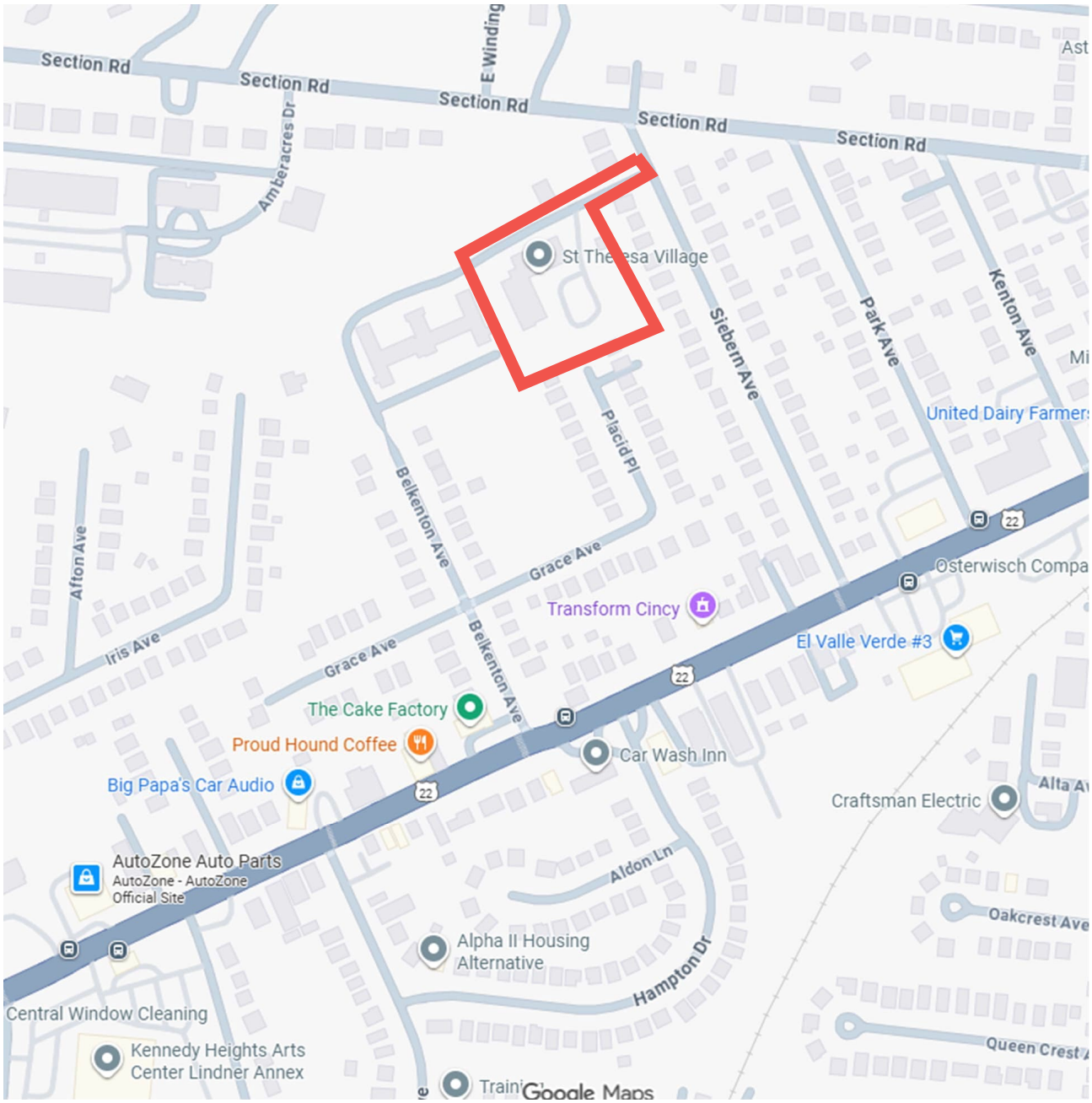
Created by: Kristina Harvey

Maxar, Microsoft

This map is a user generated static output from the OSHPO mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable..

Tax Map	↑ N	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio *Parcel #: 602-0001-0059-00*	**DOMINION DUE DILIGENCE GROUP**

Site Topographic Map	↑ N	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio *Topographic Quadrangle:* *East Cincinnati, Ohio 2023*	**DOMINION DUE DILIGENCE GROUP**



Site Locator Map	↑ N	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio	**DOMINION DUE DILIGENCE GROUP**

Site Plan	↑ N	St. Theresa Village 6783 Siebern Avenue Silverton, Ohio	**DOMINION DUE DILIGENCE GROUP**

1: View of the subject property signage

2: View of the subject property

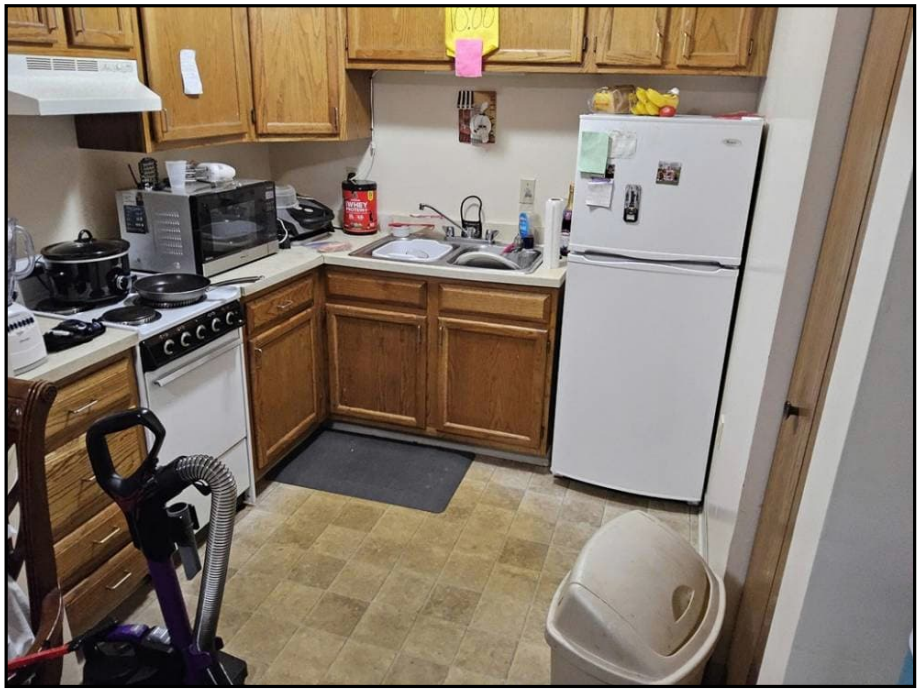
3: View of the subject property

4: View of the subject property

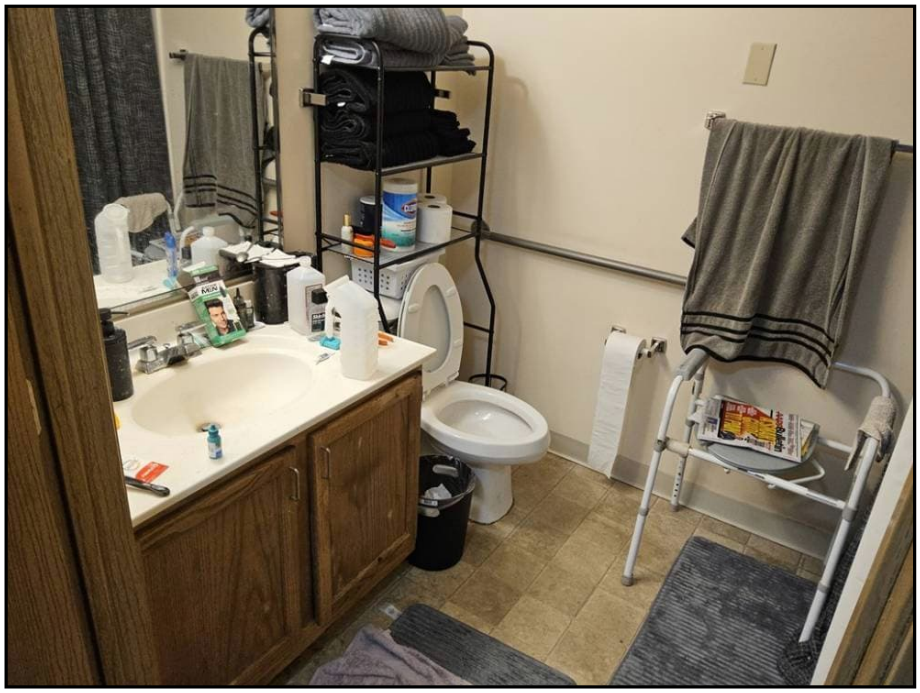
5: View of the subject property

6: View of the typical residential living room

7: View of the typical residential bedroom



8: View of the typical residential kitchen

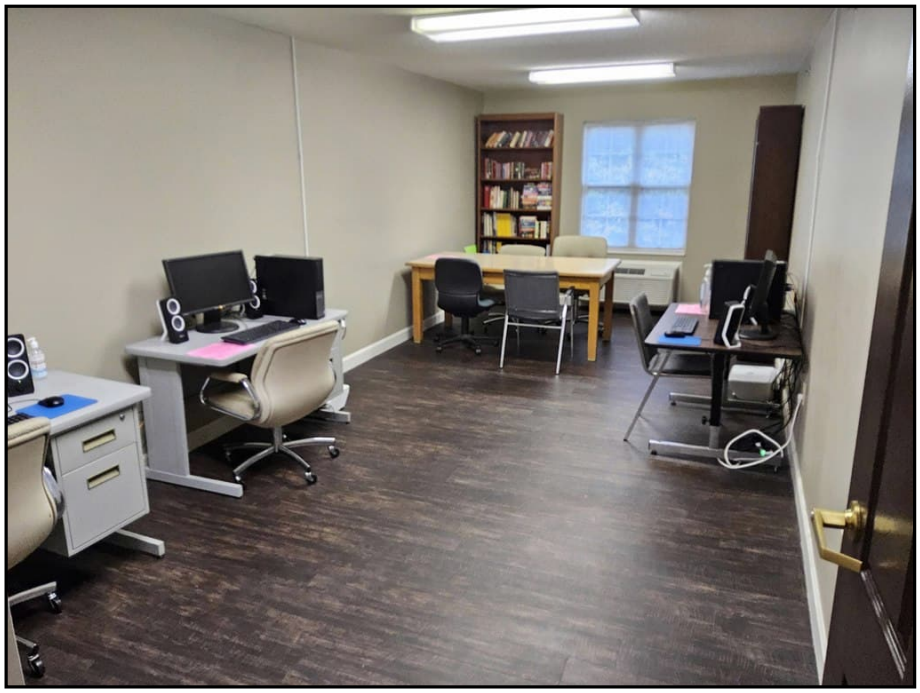


9: View of the typical residential bathroom

10: View of the laundry facilities

11: View of the community dining space

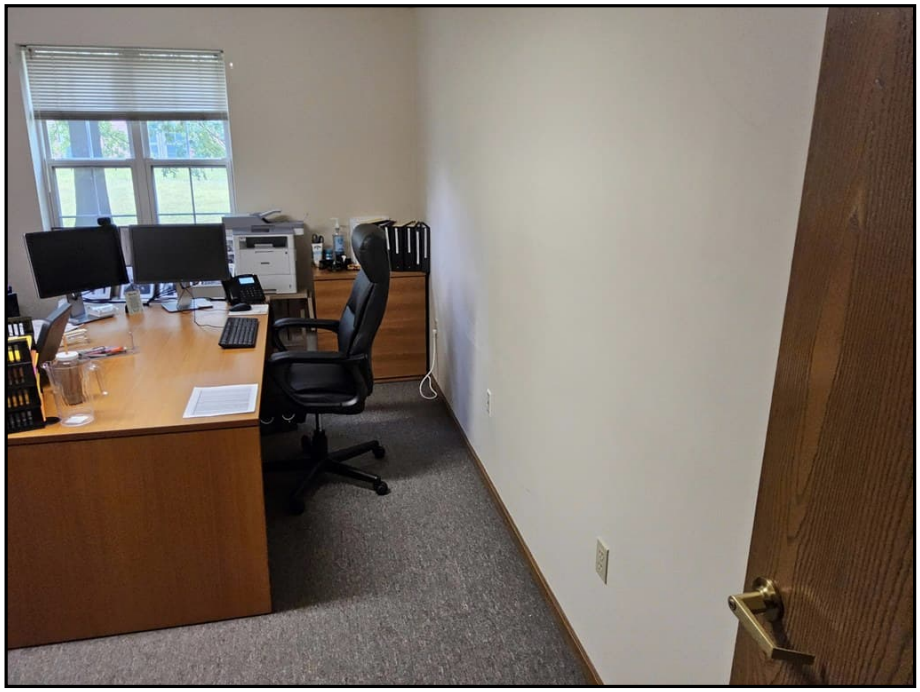
12: View of the community kitchen



13: View of the Wellness Center

14: View of the mail kiosk

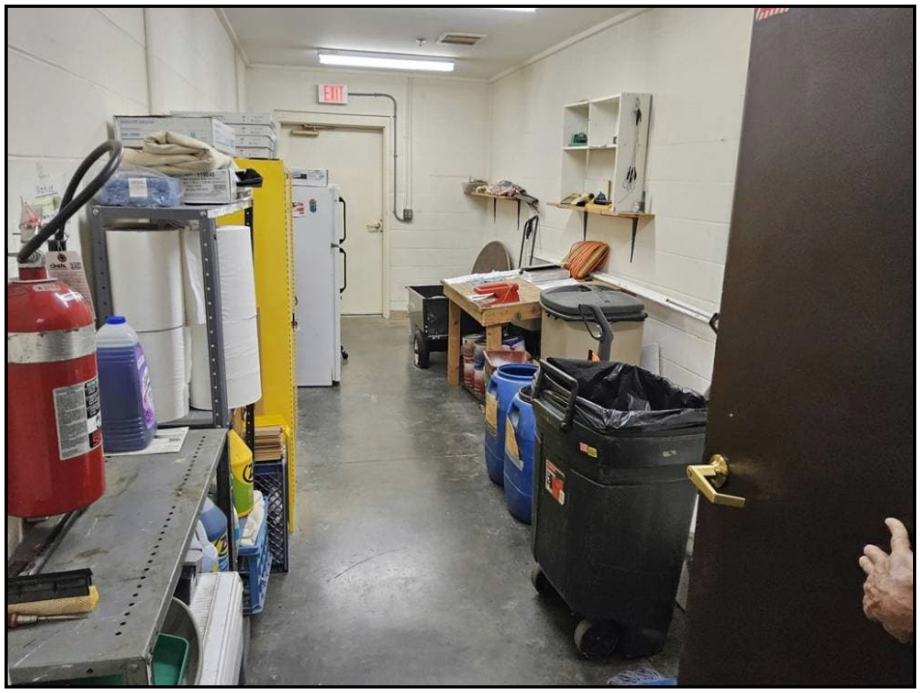
15: View of the leasing center



16: View of a typical office

17: View of a storage room

18: View of the elevator



19: View of a storage area

20: View of the maintenance area

21: View of a typical patio

22: View of the exterior shed

23: View of the pad-mounted transformer

24: View of the dumpster

25: View of the elevator equipment

26: View of the northern adjacent undeveloped wooded land

27: View of a typical northern adjacent multi-family residential

28: View of typical eastern adjacent single-family residential

29: View of a typical southern adjacent single-family residential

30: View of the western vacant, former St. Theresa Care Center

In reply, please refer to:
2025-HAM-66670

October 21, 2025

Kristina Harvey
NEPA Specialist, Dominion Due Diligence
201 Wylderose Dr
Midlothian, VA 23113

RE: **St. Theresa Village - 783 Siebern Ave, Silverton, Hamilton County, OH 45236**

Dear Ms. Harvey:

This letter is in response to correspondence received on October 7, 2025. Our comments are made in accordance with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. 306108 [36 CFR 800]).

Under the U.S. Department of Housing and Urban Development's Rental Assistance Demonstration (RAD) program, the applicant is proposing improvements to St. Theresa Village. The subject property was constructed in 1996, and is located at the above-listed address.

A check of our records indicates that this property is not listed in the National Register of Historic Places or included in the Ohio Historic Inventory. The property is not 50 years or older, and does not meet the minimum criteria for inclusion in the National Register of Historic Places. Therefore, it is the opinion of the SHPO that the proposed work will have no effect on historic properties. No further coordination with this office is necessary unless the project changes.

If you have any questions, please contact Miranda Fisher at mfisher@ohiohistory.org. Thank you for your cooperation.

Sincerely,

Miranda Fisher
Architecture Transportation Reviews Manager
Resource Protection and Review
State Historic Preservation Office

"Please be advised that this is a Section 106 decision. This review decision may not extend to other SHPO programs."
RPR Serial No: 1111258

Appendix A

When To Consult With Tribes Under Section 106

Section 106 requires consultation with federally-recognized Indian tribes when a project may affect a historic property of religious and cultural significance to the tribe. Historic properties of religious and cultural significance include: archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places, traditional cultural landscapes, plant and animal communities, and buildings and structures with significant tribal association. The types of activities that may affect historic properties of religious and cultural significance include: ground disturbance (digging), new construction in undeveloped natural areas, introduction of incongruent visual, audible, or atmospheric changes, work on a building with significant tribal association, and transfer, lease or sale of properties of the types listed above.

If a project includes any of the types of activities below, invite tribes to consult:

- [X] **significant ground disturbance (digging)**
  Examples: new sewer lines, utility lines (above and below ground), foundations, footings, grading, access roads

- [ ] **new construction in undeveloped natural areas**
  Examples: industrial-scale energy facilities, transmission lines, pipelines, or new recreational facilities, in undeveloped natural areas like mountaintops, canyons, islands, forests, native grasslands, etc., and housing, commercial, and industrial facilities in such areas

- [ ] **incongruent visual changes**
  Examples: construction of a focal point that is out of character with the surrounding natural area, impairment of the vista or viewshed from an observation point in the natural landscape, or impairment of the recognized historic scenic qualities of an area

- [ ] **incongruent audible changes**
  Examples: increase in noise levels above an acceptable standard in areas known for their quiet, contemplative experience

- [ ] **incongruent atmospheric changes**
  Examples: introduction of lights that create skyglow in an area with a dark night sky

- [ ] **work on a building with significant tribal association**
  Examples: rehabilitation, demolition or removal of a surviving ancient tribal structure or village, or a building or structure that there is reason to believe was the location of a significant tribal event, home of an important person, or that served as a tribal school or community hall

- [ ] **transfer, lease or sale of a historic property of religious and cultural significance**
  Example: transfer, lease or sale of properties that contain archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, plant and animal communities, or buildings and structures with significant tribal association

- [ ] **None of the above apply**

St. Theresa Village		
Project	**Reviewed By**	**Date**

Tribal Directory Assessment Information

Contact Information for Tribes with Interests in Hamilton County, Ohio

	Tribal Name	County Name
−	Eastern Shawnee Tribe of Oklahoma	Hamilton

Contact Name	Title	Mailing Address	Work Phone	Fax Number	Email Address	URL
Lora Nuckolls	THPO/ Cultural Preservation Program Director	70500 E 128 Rd., Wyandotte, OK - 74370	(918) 238-5151 Ext. 1840		thpo@estoo.net	www.estoo-nsn.gov
Glenna Wallace	Chief	12755 S. 705 Rd., Wyandotte, OK - 74370	(918) 666-2435	(918) 666-2186	gjwallace@estoo.net	www.estoo-nsn.gov

−	Miami Tribe of Oklahoma	Hamilton

Contact Name	Title	Mailing Address	Work Phone	Fax Number	Email Address	URL
Douglas Lankford	Chief	3410 P St., Miami, OK - 74354	(918) 541-1300	(918) 542-7260	thpo@miamination.com	http://www.miamination.com
Logan York	THPO	P.O. Box 1326, Miami, OK - 74355	918-541-7885		thpo@miamination.com	http://www.miamination.com

−	Osage Nation	Hamilton

Contact Name	Title	Mailing Address	Work Phone	Fax Number	Email Address	URL
Andrea A. Hunter	Director and THPO	N/A, Pawhuska, OK - 74056	(918) 287-5328	(918) 287-5376	s106@osagenation-nsn.gov	https://www.osageculture.com/culture/historic-preservation-office

−	Seneca-Cayuga Nation	Hamilton

Contact Name	Title	Mailing Address	Work Phone	Fax Number	Email Address	URL
Charles Diebold	Chief	23701 South 655 Road, Grove, OK - 74344	(918) 787-5452	(918) 787-5521	cdiebold@sctribe.com	http://www.sctribe.com/
William Tarrant	THPO	P.O. Box 453220, Grove, OK - 74345	(918)-791-6061		wtarrant@sctribe.com	http://www.sctribe.com/

1 - 4 of 4 results

« ‹ 1 › » 10

October 7, 2025

Glenna Wallace, Chief
Eastern Shawnee Tribe of Oklahoma
12755 S. 705 Rd.
Wyandotte, OK - 74370

Subject: THPO Consultation Request
St. Theresa Village
6783 Siebern Avenue
Silverton, Ohio 45236
Parcel ID #: 602-0001-0059-00 (2.171 AC) & 060200010432 (1.3 AC)
Latitude: 39.1933, Longitude: -84.409465

Dear Chief Wallace,

HUD is considering funding the project listed above with federal funds from the U.S. Department of Housing and Urban Development (HUD). HUD's environmental review responsibilities for the project include tribal consultation related to historic properties. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

HUD will conduct a review of this project to comply with Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR Part 800. We would like to invite you to be a consulting party in this review to help identify historic properties in the project area that may have religious and cultural significance to your tribe, and if such properties exist, to help assess how the project might affect them. If the project might have an adverse effect, we would like to discuss possible ways to avoid, minimize or mitigate potential adverse effects.

PRESENT CONDITION OF THE SITE:
The subject property consists of one (1) three-story age-restricted apartment structures constructed in 1996. The subject property structures contain a total of fifty (50) age-restricted residential dwelling units and are situated on approximately 2.171 acres of land. The subject property contains a gross building area of approximately 42,192 square feet. Located within the apartment structure are laundry facilities, a leasing office, maintenance areas, a mail kiosk, a wellness center, a community kitchen and dining area, and storage areas. Exterior property improvements include a maintenance shed, landscaped regions, and asphalt parking areas. The subject property is serviced by electricity, natural gas, and municipally supplied water and sewer.

AREA OF POTENTIAL EFFECT (APE):

The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex. Proposed interior repairs consist of the addition of audio/visual alarms, insulation, a fitness room, rent drop box, trash chute, garbage disposals, as well as sprinkler heads; hardware, threshold, and apartment feature adjustments to comply with federal accessibility standards as well as one (1) 2 bedroom unit to an office suite; the repainting of all walls/ceilings; the reconfiguration of one (1) unit to a handicap accessible unit; the replacement of the interior signage, common area furniture, gas fired water heaters, HVAC equipment, elevator cab finishes, fire extinguishers, fire arm control panels, flooring, mail boxes, doors, appliances, bathroom accessories, countertops, plumbing fixtures, shelving, baseboards, window sills, window jamb extensions, hand/chair rails, lighting, automatic door openers, window treatments, ACT ceiling tiles, common area kitchen cabinets/countertops, stair treads, wall/ceiling finishes, and camera system; and the relocation of the community kitchen to the a larger community space. Proposed exterior repairs consist of the addition of vertical signage at the handicap parking spaces, an accessible route to the dumpster enclosures, bollards at the rear of the property, and positive drainage away from buildings; the repainting of the lintels; the tuckpointing of the brick veneer; the milling and overlaying of the existing parking lot; the replacement of the dumpster enclosures, property signage, windows, EPDM roofing, soffits/fascia, gutters/downspouts, doors, siding, exhaust vent covers, lighting, balcony guard rails, as well as the wood decking; and landscaping. The Direct Area of Potential Effects (APE) includes only the subject property, as no off-site ground disturbance is proposed. The Indirect APE includes any vicinity properties within an approximate 0.10-mile view-shed to the subject property, as delineated on the attached map.

DIRECT APE HISTORY:

According to the reviewed subject property historical information, the subject property consisted of vacant land and a private drive in 1937, undeveloped wooded and grassland with a garden path associated with the western adjacent vacant, former St. Theresa's Care Home from at least 1938 until construction of the current subject property structure in 1996. Vicinity structures within the APE date to at least the 1930s.

REVIEW OF HISTORIC PROPERTY LISTINGS:

A review of the National Register of Historic Places and the Ohio History Connection Map, accessed at https://www.ohiohistory.org/preserve/state-historic-preservation-office/mapping, indicates that the subject property structure is not listed on the National Register of Historic Places; is not located within, or adjacent to, a Historic District; and is not listed as a local landmark. Numerous structures located within the indirect (visual) APE are listed as locally historic resources; however, given the modern age of the subject property structure, the proposed undertaking is anticipated to have No Effect on these resources. Based on the date of construction (1996), the subject property structure is not suspected to be eligible for listing on the National Register.

Should the proposed work or project area change, these recommendations may not apply, and additional fieldwork may be necessary. Should unanticipated archaeological

or historical resources be encountered during any future activities, all ground-disturbing activity in the vicinity of the find should be halted and the Ohio SHPO notified immediately.

In the event that Native American ancestral remains, funerary objects, sacred objects, and objects of cultural patrimony are discovered during the proposed work, they will be treated with respect, secured, and protected until such a time as the appropriate action has been determined, in accordance with appliable state statutes.

Ohio State Law provides specific protocol for the discovery of human remains, funerary objects, sacred objects, and objects of cultural patrimony on non-federal public and private land. If human remains are discovered, all work will halt near the discovery site, and the remains will be protected. All human remains will be assumed to be Native American unless proven otherwise. Immediately notify the Ohio State Police, the SHPO, the appropriate Tribes, and the Commission on Indian Services. No remains or associated artifacts will be removed without authorization.

To meet project timeframes, if you would like to be a consulting party on this project, please let us know of your interest within 30 days. If you have any initial concerns with impacts of the project on religious or cultural properties, please note them in your response.

Enclosed are site maps that show the project area and, if applicable, an additional area of potential indirect effects. Also attached are property photographs.

More information on the Section 106 review process is available at http://www.onecpd.info/environmental-review/historic-preservation/.

HUD's process for tribal consultation under Section 106 is described in a Notice available at https://www.onecpd.info/resource/2448/notice-cpd-12-006-tribal-consultation-under-24-cfr-part-58.

If you do not wish to consult on this project, please inform us. If you do wish to consult, please include in your reply the name and contact information for the tribe's principal representative in the consultation. Thank you very much. We value your assistance and look forward to consulting further if there are historic properties of religious and cultural significance to your tribe that may be affected by this project.

Sincerely,

US DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

October 7, 2025

Lora Nuckolls, THPO/ Cultural Preservation Program Director
Eastern Shawnee Tribe of Oklahoma
70500 E 128 Rd.
Wyandotte, OK - 74370

Subject: THPO Consultation Request
St. Theresa Village
6783 Siebern Avenue
Silverton, Ohio 45236
Parcel ID #: 602-0001-0059-00 (2.171 AC) & 060200010432 (1.3 AC)
Latitude: 39.1933, Longitude: -84.409465

Dear THPO/ Cultural Preservation Program Director Nuckolls,

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Sincerely,

US DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

October 7, 2025

Douglas Lankford, Chief
Miami Tribe of Oklahoma
3410 P St.
Miami, OK - 74354

Subject: THPO Consultation Request
St. Theresa Village
6783 Siebern Avenue
Silverton, Ohio 45236
Parcel ID #: 602-0001-0059-00 (2.171 AC) & 060200010432 (1.3 AC)
Latitude: 39.1933, Longitude: -84.409465

Dear Chief Lankford,

HUD is considering funding the project listed above with federal funds from the U.S. Department of Housing and Urban Development (HUD). HUD's environmental review responsibilities for the project include tribal consultation related to historic properties. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

HUD will conduct a review of this project to comply with Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR Part 800. We would like to invite you to be a consulting party in this review to help identify historic properties in the project area that may have religious and cultural significance to your tribe, and if such properties exist, to help assess how the project might affect them. If the project might have an adverse effect, we would like to discuss possible ways to avoid, minimize or mitigate potential adverse effects.

PRESENT CONDITION OF THE SITE:
The subject property consists of one (1) three-story age-restricted apartment structures constructed in 1996. The subject property structures contain a total of fifty (50) age-restricted residential dwelling units and are situated on approximately 2.171 acres of land. The subject property contains a gross building area of approximately 42,192 square feet. Located within the apartment structure are laundry facilities, a leasing office, maintenance areas, a mail kiosk, a wellness center, a community kitchen and dining area, and storage areas. Exterior property improvements include a maintenance shed, landscaped regions, and asphalt parking areas. The subject property is serviced by electricity, natural gas, and municipally supplied water and sewer.

AREA OF POTENTIAL EFFECT (APE):

The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex. Proposed interior repairs consist of the addition of audio/visual alarms, insulation, a fitness room, rent drop box, trash chute, garbage disposals, as well as sprinkler heads; hardware, threshold, and apartment feature adjustments to comply with federal accessibility standards as well as one (1) 2 bedroom unit to an office suite; the repainting of all walls/ceilings; the reconfiguration of one (1) unit to a handicap accessible unit; the replacement of the interior signage, common area furniture, gas fired water heaters, HVAC equipment, elevator cab finishes, fire extinguishers, fire arm control panels, flooring, mail boxes, doors, appliances, bathroom accessories, countertops, plumbing fixtures, shelving, baseboards, window sills, window jamb extensions, hand/chair rails, lighting, automatic door openers, window treatments, ACT ceiling tiles, common area kitchen cabinets/countertops, stair treads, wall/ceiling finishes, and camera system; and the relocation of the community kitchen to the a larger community space. Proposed exterior repairs consist of the addition of vertical signage at the handicap parking spaces, an accessible route to the dumpster enclosures, bollards at the rear of the property, and positive drainage away from buildings; the repainting of the lintels; the tuckpointing of the brick veneer; the milling and overlaying of the existing parking lot; the replacement of the dumpster enclosures, property signage, windows, EPDM roofing, soffits/fascia, gutters/downspouts, doors, siding, exhaust vent covers, lighting, balcony guard rails, as well as the wood decking; and landscaping. The Direct Area of Potential Effects (APE) includes only the subject property, as no off-site ground disturbance is proposed. The Indirect APE includes any vicinity properties within an approximate 0.10-mile view-shed to the subject property, as delineated on the attached map.

DIRECT APE HISTORY:

According to the reviewed subject property historical information, the subject property consisted of vacant land and a private drive in 1937, undeveloped wooded and grassland with a garden path associated with the western adjacent vacant, former St. Theresa's Care Home from at least 1938 until construction of the current subject property structure in 1996. Vicinity structures within the APE date to at least the 1930s.

REVIEW OF HISTORIC PROPERTY LISTINGS:

A review of the National Register of Historic Places and the Ohio History Connection Map, accessed at https://www.ohiohistory.org/preserve/state-historic-preservation-office/mapping, indicates that the subject property structure is not listed on the National Register of Historic Places; is not located within, or adjacent to, a Historic District; and is not listed as a local landmark. Numerous structures located within the indirect (visual) APE are listed as locally historic resources; however, given the modern age of the subject property structure, the proposed undertaking is anticipated to have No Effect on these resources. Based on the date of construction (1996), the subject property structure is not suspected to be eligible for listing on the National Register.

Should the proposed work or project area change, these recommendations may not apply, and additional fieldwork may be necessary. Should unanticipated archaeological

or historical resources be encountered during any future activities, all ground-disturbing activity in the vicinity of the find should be halted and the Ohio SHPO notified immediately.

In the event that Native American ancestral remains, funerary objects, sacred objects, and objects of cultural patrimony are discovered during the proposed work, they will be treated with respect, secured, and protected until such a time as the appropriate action has been determined, in accordance with appliable state statutes.

Ohio State Law provides specific protocol for the discovery of human remains, funerary objects, sacred objects, and objects of cultural patrimony on non-federal public and private land. If human remains are discovered, all work will halt near the discovery site, and the remains will be protected. All human remains will be assumed to be Native American unless proven otherwise. Immediately notify the Ohio State Police, the SHPO, the appropriate Tribes, and the Commission on Indian Services. No remains or associated artifacts will be removed without authorization.

To meet project timeframes, if you would like to be a consulting party on this project, please let us know of your interest within 30 days. If you have any initial concerns with impacts of the project on religious or cultural properties, please note them in your response.

Enclosed are site maps that show the project area and, if applicable, an additional area of potential indirect effects. Also attached are property photographs.

More information on the Section 106 review process is available at http://www.onecpd.info/environmental-review/historic-preservation/.

HUD's process for tribal consultation under Section 106 is described in a Notice available at https://www.onecpd.info/resource/2448/notice-cpd-12-006-tribal-consultation-under-24-cfr-part-58.

If you do not wish to consult on this project, please inform us. If you do wish to consult, please include in your reply the name and contact information for the tribe's principal representative in the consultation. Thank you very much. We value your assistance and look forward to consulting further if there are historic properties of religious and cultural significance to your tribe that may be affected by this project.

Sincerely,

US DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

October 7, 2025

Logan York, THPO
Miami Tribe of Oklahoma
P.O. Box 1326
Miami, OK - 74355

Subject: THPO Consultation Request
St. Theresa Village
6783 Siebern Avenue
Silverton, Ohio 45236
Parcel ID #: 602-0001-0059-00 (2.171 AC) & 060200010432 (1.3 AC)
Latitude: 39.1933, Longitude: -84.409465

Dear THPO York,

HUD is considering funding the project listed above with federal funds from the U.S. Department of Housing and Urban Development (HUD). HUD's environmental review responsibilities for the project include tribal consultation related to historic properties. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

HUD will conduct a review of this project to comply with Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR Part 800. We would like to invite you to be a consulting party in this review to help identify historic properties in the project area that may have religious and cultural significance to your tribe, and if such properties exist, to help assess how the project might affect them. If the project might have an adverse effect, we would like to discuss possible ways to avoid, minimize or mitigate potential adverse effects.

PRESENT CONDITION OF THE SITE:
The subject property consists of one (1) three-story age-restricted apartment structures constructed in 1996. The subject property structures contain a total of fifty (50) age-restricted residential dwelling units and are situated on approximately 2.171 acres of land. The subject property contains a gross building area of approximately 42,192 square feet. Located within the apartment structure are laundry facilities, a leasing office, maintenance areas, a mail kiosk, a wellness center, a community kitchen and dining area, and storage areas. Exterior property improvements include a maintenance shed, landscaped regions, and asphalt parking areas. The subject property is serviced by electricity, natural gas, and municipally supplied water and sewer.

AREA OF POTENTIAL EFFECT (APE):

The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex. Proposed interior repairs consist of the addition of audio/visual alarms, insulation, a fitness room, rent drop box, trash chute, garbage disposals, as well as sprinkler heads; hardware, threshold, and apartment feature adjustments to comply with federal accessibility standards as well as one (1) 2 bedroom unit to an office suite; the repainting of all walls/ceilings; the reconfiguration of one (1) unit to a handicap accessible unit; the replacement of the interior signage, common area furniture, gas fired water heaters, HVAC equipment, elevator cab finishes, fire extinguishers, fire arm control panels, flooring, mail boxes, doors, appliances, bathroom accessories, countertops, plumbing fixtures, shelving, baseboards, window sills, window jamb extensions, hand/chair rails, lighting, automatic door openers, window treatments, ACT ceiling tiles, common area kitchen cabinets/countertops, stair treads, wall/ceiling finishes, and camera system; and the relocation of the community kitchen to the a larger community space. Proposed exterior repairs consist of the addition of vertical signage at the handicap parking spaces, an accessible route to the dumpster enclosures, bollards at the rear of the property, and positive drainage away from buildings; the repainting of the lintels; the tuckpointing of the brick veneer; the milling and overlaying of the existing parking lot; the replacement of the dumpster enclosures, property signage, windows, EPDM roofing, soffits/fascia, gutters/downspouts, doors, siding, exhaust vent covers, lighting, balcony guard rails, as well as the wood decking; and landscaping. The Direct Area of Potential Effects (APE) includes only the subject property, as no off-site ground disturbance is proposed. The Indirect APE includes any vicinity properties within an approximate 0.10-mile view-shed to the subject property, as delineated on the attached map.

DIRECT APE HISTORY:

According to the reviewed subject property historical information, the subject property consisted of vacant land and a private drive in 1937, undeveloped wooded and grassland with a garden path associated with the western adjacent vacant, former St. Theresa's Care Home from at least 1938 until construction of the current subject property structure in 1996. Vicinity structures within the APE date to at least the 1930s.

REVIEW OF HISTORIC PROPERTY LISTINGS:

A review of the National Register of Historic Places and the Ohio History Connection Map, accessed at https://www.ohiohistory.org/preserve/state-historic-preservation-office/mapping, indicates that the subject property structure is not listed on the National Register of Historic Places; is not located within, or adjacent to, a Historic District; and is not listed as a local landmark. Numerous structures located within the indirect (visual) APE are listed as locally historic resources; however, given the modern age of the subject property structure, the proposed undertaking is anticipated to have No Effect on these resources. Based on the date of construction (1996), the subject property structure is not suspected to be eligible for listing on the National Register.

Should the proposed work or project area change, these recommendations may not apply, and additional fieldwork may be necessary. Should unanticipated archaeological

or historical resources be encountered during any future activities, all ground-disturbing activity in the vicinity of the find should be halted and the Ohio SHPO notified immediately.

In the event that Native American ancestral remains, funerary objects, sacred objects, and objects of cultural patrimony are discovered during the proposed work, they will be treated with respect, secured, and protected until such a time as the appropriate action has been determined, in accordance with appliable state statutes.

Ohio State Law provides specific protocol for the discovery of human remains, funerary objects, sacred objects, and objects of cultural patrimony on non-federal public and private land. If human remains are discovered, all work will halt near the discovery site, and the remains will be protected. All human remains will be assumed to be Native American unless proven otherwise. Immediately notify the Ohio State Police, the SHPO, the appropriate Tribes, and the Commission on Indian Services. No remains or associated artifacts will be removed without authorization.

To meet project timeframes, if you would like to be a consulting party on this project, please let us know of your interest within 30 days. If you have any initial concerns with impacts of the project on religious or cultural properties, please note them in your response.

Enclosed are site maps that show the project area and, if applicable, an additional area of potential indirect effects. Also attached are property photographs.

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HUD's process for tribal consultation under Section 106 is described in a Notice available at https://www.onecpd.info/resource/2448/notice-cpd-12-006-tribal-consultation-under-24-cfr-part-58.

If you do not wish to consult on this project, please inform us. If you do wish to consult, please include in your reply the name and contact information for the tribe's principal representative in the consultation. Thank you very much. We value your assistance and look forward to consulting further if there are historic properties of religious and cultural significance to your tribe that may be affected by this project.

Sincerely,

US DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

October 7, 2025

Andrea A. Hunter, THPO
Osage Nation
239 West 12th Street
Pawhuska, OK 74056

Subject: THPO Consultation Request
St. Theresa Village
6783 Siebern Avenue
Silverton, Ohio 45236
Parcel ID #: 602-0001-0059-00 (2.171 AC) & 060200010432 (1.3 AC)
Latitude: 39.1933, Longitude: -84.409465

Dear THPO Hunter,

HUD is considering funding the project listed above with federal funds from the U.S. Department of Housing and Urban Development (HUD). HUD's environmental review responsibilities for the project include tribal consultation related to historic properties. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

HUD will conduct a review of this project to comply with Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR Part 800. We would like to invite you to be a consulting party in this review to help identify historic properties in the project area that may have religious and cultural significance to your tribe, and if such properties exist, to help assess how the project might affect them. If the project might have an adverse effect, we would like to discuss possible ways to avoid, minimize or mitigate potential adverse effects.

PRESENT CONDITION OF THE SITE:
The subject property consists of one (1) three-story age-restricted apartment structures constructed in 1996. The subject property structures contain a total of fifty (50) age-restricted residential dwelling units and are situated on approximately 2.171 acres of land. The subject property contains a gross building area of approximately 42,192 square feet. Located within the apartment structure are laundry facilities, a leasing office, maintenance areas, a mail kiosk, a wellness center, a community kitchen and dining area, and storage areas. Exterior property improvements include a maintenance shed, landscaped regions, and asphalt parking areas. The subject property is serviced by electricity, natural gas, and municipally supplied water and sewer.

AREA OF POTENTIAL EFFECT (APE):

The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex. Proposed interior repairs consist of the addition of audio/visual alarms, insulation, a fitness room, rent drop box, trash chute, garbage disposals, as well as sprinkler heads; hardware, threshold, and apartment feature adjustments to comply with federal accessibility standards as well as one (1) 2 bedroom unit to an office suite; the repainting of all walls/ceilings; the reconfiguration of one (1) unit to a handicap accessible unit; the replacement of the interior signage, common area furniture, gas fired water heaters, HVAC equipment, elevator cab finishes, fire extinguishers, fire arm control panels, flooring, mail boxes, doors, appliances, bathroom accessories, countertops, plumbing fixtures, shelving, baseboards, window sills, window jamb extensions, hand/chair rails, lighting, automatic door openers, window treatments, ACT ceiling tiles, common area kitchen cabinets/countertops, stair treads, wall/ceiling finishes, and camera system; and the relocation of the community kitchen to the a larger community space. Proposed exterior repairs consist of the addition of vertical signage at the handicap parking spaces, an accessible route to the dumpster enclosures, bollards at the rear of the property, and positive drainage away from buildings; the repainting of the lintels; the tuckpointing of the brick veneer; the milling and overlaying of the existing parking lot; the replacement of the dumpster enclosures, property signage, windows, EPDM roofing, soffits/fascia, gutters/downspouts, doors, siding, exhaust vent covers, lighting, balcony guard rails, as well as the wood decking; and landscaping. The Direct Area of Potential Effects (APE) includes only the subject property, as no off-site ground disturbance is proposed. The Indirect APE includes any vicinity properties within an approximate 0.10-mile view-shed to the subject property, as delineated on the attached map.

DIRECT APE HISTORY:

According to the reviewed subject property historical information, the subject property consisted of vacant land and a private drive in 1937, undeveloped wooded and grassland with a garden path associated with the western adjacent vacant, former St. Theresa's Care Home from at least 1938 until construction of the current subject property structure in 1996. Vicinity structures within the APE date to at least the 1930s.

REVIEW OF HISTORIC PROPERTY LISTINGS:

A review of the National Register of Historic Places and the Ohio History Connection Map, accessed at https://www.ohiohistory.org/preserve/state-historic-preservation-office/mapping, indicates that the subject property structure is not listed on the National Register of Historic Places; is not located within, or adjacent to, a Historic District; and is not listed as a local landmark. Numerous structures located within the indirect (visual) APE are listed as locally historic resources; however, given the modern age of the subject property structure, the proposed undertaking is anticipated to have No Effect on these resources. Based on the date of construction (1996), the subject property structure is not suspected to be eligible for listing on the National Register.

Should the proposed work or project area change, these recommendations may not apply, and additional fieldwork may be necessary. Should unanticipated archaeological

or historical resources be encountered during any future activities, all ground-disturbing activity in the vicinity of the find should be halted and the Ohio SHPO notified immediately.

In the event that Native American ancestral remains, funerary objects, sacred objects, and objects of cultural patrimony are discovered during the proposed work, they will be treated with respect, secured, and protected until such a time as the appropriate action has been determined, in accordance with appliable state statutes.

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If you do not wish to consult on this project, please inform us. If you do wish to consult, please include in your reply the name and contact information for the tribe's principal representative in the consultation. Thank you very much. We value your assistance and look forward to consulting further if there are historic properties of religious and cultural significance to your tribe that may be affected by this project.

Sincerely,

US DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

October 7, 2025

Charles Diebold, Chief
Seneca-Cayuga Nation
23701 South 655 Road
Grove, OK - 74344

Subject: THPO Consultation Request
St. Theresa Village
6783 Siebern Avenue
Silverton, Ohio 45236
Parcel ID #: 602-0001-0059-00 (2.171 AC) & 060200010432 (1.3 AC)
Latitude: 39.1933, Longitude: -84.409465

Dear Chief Diebold,

HUD is considering funding the project listed above with federal funds from the U.S. Department of Housing and Urban Development (HUD). HUD's environmental review responsibilities for the project include tribal consultation related to historic properties. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

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PRESENT CONDITION OF THE SITE:

The subject property consists of one (1) three-story age-restricted apartment structures constructed in 1996. The subject property structures contain a total of fifty (50) age-restricted residential dwelling units and are situated on approximately 2.171 acres of land. The subject property contains a gross building area of approximately 42,192 square feet. Located within the apartment structure are laundry facilities, a leasing office, maintenance areas, a mail kiosk, a wellness center, a community kitchen and dining area, and storage areas. Exterior property improvements include a maintenance shed, landscaped regions, and asphalt parking areas. The subject property is serviced by electricity, natural gas, and municipally supplied water and sewer.

AREA OF POTENTIAL EFFECT (APE):

The Sponsor is submitting this project for a HUD Rental Assistance Demonstration (RAD) conversion, with additional funding through an Ohio Finance Housing Agency 4% low-income housing tax credit (LIHTC) submission, consisting of the rehabilitation of the existing age-restricted apartment complex. Proposed interior repairs consist of the addition of audio/visual alarms, insulation, a fitness room, rent drop box, trash chute, garbage disposals, as well as sprinkler heads; hardware, threshold, and apartment feature adjustments to comply with federal accessibility standards as well as one (1) 2 bedroom unit to an office suite; the repainting of all walls/ceilings; the reconfiguration of one (1) unit to a handicap accessible unit; the replacement of the interior signage, common area furniture, gas fired water heaters, HVAC equipment, elevator cab finishes, fire extinguishers, fire arm control panels, flooring, mail boxes, doors, appliances, bathroom accessories, countertops, plumbing fixtures, shelving, baseboards, window sills, window jamb extensions, hand/chair rails, lighting, automatic door openers, window treatments, ACT ceiling tiles, common area kitchen cabinets/countertops, stair treads, wall/ceiling finishes, and camera system; and the relocation of the community kitchen to the a larger community space. Proposed exterior repairs consist of the addition of vertical signage at the handicap parking spaces, an accessible route to the dumpster enclosures, bollards at the rear of the property, and positive drainage away from buildings; the repainting of the lintels; the tuckpointing of the brick veneer; the milling and overlaying of the existing parking lot; the replacement of the dumpster enclosures, property signage, windows, EPDM roofing, soffits/fascia, gutters/downspouts, doors, siding, exhaust vent covers, lighting, balcony guard rails, as well as the wood decking; and landscaping. The Direct Area of Potential Effects (APE) includes only the subject property, as no off-site ground disturbance is proposed. The Indirect APE includes any vicinity properties within an approximate 0.10-mile view-shed to the subject property, as delineated on the attached map.

DIRECT APE HISTORY:

According to the reviewed subject property historical information, the subject property consisted of vacant land and a private drive in 1937, undeveloped wooded and grassland with a garden path associated with the western adjacent vacant, former St. Theresa's Care Home from at least 1938 until construction of the current subject property structure in 1996. Vicinity structures within the APE date to at least the 1930s.

REVIEW OF HISTORIC PROPERTY LISTINGS:

A review of the National Register of Historic Places and the Ohio History Connection Map, accessed at https://www.ohiohistory.org/preserve/state-historic-preservation-office/mapping, indicates that the subject property structure is not listed on the National Register of Historic Places; is not located within, or adjacent to, a Historic District; and is not listed as a local landmark. Numerous structures located within the indirect (visual) APE are listed as locally historic resources; however, given the modern age of the subject property structure, the proposed undertaking is anticipated to have No Effect on these resources. Based on the date of construction (1996), the subject property structure is not suspected to be eligible for listing on the National Register.

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Sincerely,

US DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

October 7, 2025

William Tarrant, THPO
Seneca-Cayuga Nation
P.O. Box 453220
Grove, OK - 74345

Subject: THPO Consultation Request
St. Theresa Village
6783 Siebern Avenue
Silverton, Ohio 45236
Parcel ID #: 602-0001-0059-00 (2.171 AC) & 060200010432 (1.3 AC)
Latitude: 39.1933, Longitude: -84.409465

Dear THPO Tarrant,

HUD is considering funding the project listed above with federal funds from the U.S. Department of Housing and Urban Development (HUD). HUD's environmental review responsibilities for the project include tribal consultation related to historic properties. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

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AREA OF POTENTIAL EFFECT (APE):

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According to the reviewed subject property historical information, the subject property consisted of vacant land and a private drive in 1937, undeveloped wooded and grassland with a garden path associated with the western adjacent vacant, former St. Theresa's Care Home from at least 1938 until construction of the current subject property structure in 1996. Vicinity structures within the APE date to at least the 1930s.

REVIEW OF HISTORIC PROPERTY LISTINGS:

A review of the National Register of Historic Places and the Ohio History Connection Map, accessed at https://www.ohiohistory.org/preserve/state-historic-preservation-office/mapping, indicates that the subject property structure is not listed on the National Register of Historic Places; is not located within, or adjacent to, a Historic District; and is not listed as a local landmark. Numerous structures located within the indirect (visual) APE are listed as locally historic resources; however, given the modern age of the subject property structure, the proposed undertaking is anticipated to have No Effect on these resources. Based on the date of construction (1996), the subject property structure is not suspected to be eligible for listing on the National Register.

Should the proposed work or project area change, these recommendations may not apply, and additional fieldwork may be necessary. Should unanticipated archaeological

or historical resources be encountered during any future activities, all ground-disturbing activity in the vicinity of the find should be halted and the Ohio SHPO notified immediately.

In the event that Native American ancestral remains, funerary objects, sacred objects, and objects of cultural patrimony are discovered during the proposed work, they will be treated with respect, secured, and protected until such a time as the appropriate action has been determined, in accordance with appliable state statutes.

Ohio State Law provides specific protocol for the discovery of human remains, funerary objects, sacred objects, and objects of cultural patrimony on non-federal public and private land. If human remains are discovered, all work will halt near the discovery site, and the remains will be protected. All human remains will be assumed to be Native American unless proven otherwise. Immediately notify the Ohio State Police, the SHPO, the appropriate Tribes, and the Commission on Indian Services. No remains or associated artifacts will be removed without authorization.

To meet project timeframes, if you would like to be a consulting party on this project, please let us know of your interest within 30 days. If you have any initial concerns with impacts of the project on religious or cultural properties, please note them in your response.

Enclosed are site maps that show the project area and, if applicable, an additional area of potential indirect effects. Also attached are property photographs.

More information on the Section 106 review process is available at http://www.onecpd.info/environmental-review/historic-preservation/.

HUD's process for tribal consultation under Section 106 is described in a Notice available at https://www.onecpd.info/resource/2448/notice-cpd-12-006-tribal-consultation-under-24-cfr-part-58.

If you do not wish to consult on this project, please inform us. If you do wish to consult, please include in your reply the name and contact information for the tribe's principal representative in the consultation. Thank you very much. We value your assistance and look forward to consulting further if there are historic properties of religious and cultural significance to your tribe that may be affected by this project.

Sincerely,

US DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

Appendix N:

Noise Abatement and Control

Noise (CEST Level Reviews)

General requirements	Legislation	Regulation
HUD's noise regulations protect residential properties from excessive noise exposure. HUD encourages mitigation as appropriate.	Noise Control Act of 1972 General Services Administration Federal Management Circular 75-2: "Compatible Land Uses at Federal Airfields"	Title 24 CFR 51 Subpart B
References		
https://www.hudexchange.info/programs/environmental-review/noise-abatement-and-control		

1. What activities does your project involve? Check all that apply:

☐ New construction for residential use

NOTE: HUD assistance to new construction projects is generally prohibited if they are located in an Unacceptable zone, and HUD discourages assistance for new construction projects in Normally Unacceptable zones. See 24 CFR 51.101(a)(3) for further details.

→ *Continue to Question 4.*

☑ Rehabilitation of an existing residential property

NOTE: For modernization projects in all noise zones, HUD encourages mitigation to reduce levels to acceptable compliance standards. See 24 CFR 51 Subpart B for further details.

→ *Continue to Question 2.*

☐ A research demonstration project which does not result in new construction or reconstruction, interstate, land sales registration, or any timely emergency assistance under disaster assistance provisions or appropriations which are provided to save lives, protect property, protect public health and safety, remove debris and wreckage, or assistance that has the effect of restoring facilities substantially as they existed prior to the disaster

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

☐ None of the above

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

2. Do you have standardized noise attenuation measures that apply to all modernization and/or minor rehabilitation projects, such as the use of double glazed windows or extra insulation?

☑ Yes

Indicate the type of measures that will apply (check all that apply):

☑ Improved building envelope components (better windows and doors, strengthened sheathing, insulation, sealed gaps, etc.)

☐ Redesigned building envelope (more durable or substantial materials, increased air gap, resilient channels, staggered wall studs, etc.)

☐ Other

Explain:

Based on the CEST level of review, a noise survey is not required to be conducted. However, HUD encourages noise attenuation measures to be incorporated into the project where appropriate. The scope of work for the rehabilitation will include the replacement of the windows and exterior doors and increasing attic insulation, which will provide greater noise attenuation than currently exists.

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below and provide any supporting documentation.*

☐ No

→ *Continue to Question 3.*

3. Complete the Preliminary Screening to identify potential noise generators in the vicinity (1000' from a major road, 3000' from a railroad, or 15 miles from an airport).
Describe findings of the Preliminary Screening:

→ *Continue to Question 6.*

4. Complete the Preliminary Screening to identify potential noise generators in the vicinity (1000' from a major road, 3000' from a railroad, or 15 miles from an airport).
Indicate the findings of the Preliminary Screening below:

☐ There are no noise generators found within the threshold distances above.

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map showing the location of the project relative to any noise generators.*

☐ Noise generators were found within the threshold distances.

→ *Continue to Question 5.*

5. Complete the Noise Assessment Guidelines to quantify the noise exposure. Indicate the findings of the Noise Assessment below:

☐ Acceptable: (65 decibels or less; the ceiling may be shifted to 70 decibels in circumstances described in §24 CFR 51.105(a))

Indicate noise level here:

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide noise analysis, including noise level and data used to complete the analysis.*

☐ Normally Unacceptable: (Above 65 decibels but not exceeding 75 decibels; the floor may be shifted to 70 decibels in circumstances described in 24 CFR 51.105(a))

Indicate noise level here:

Is the project in a largely undeveloped area?

☐ No

→ *Your project requires completion of an Environmental Assessment (EA) pursuant to 51.104(b)(1)(i). Elevate this review to an EA-level review.*
Provide noise analysis, including noise level and data used to complete the analysis.
Continue to Question 6.

☐ Yes

→ *Your project requires completion of an Environmental Impact Statement (EIS) pursuant to 51.104(b)(1)(i). Elevate this review to an EIS-level review.*
Provide noise analysis, including noise level and data used to complete the analysis.
Continue to Question 6.

☐ Unacceptable: (Above 75 decibels)

Indicate noise level here:

Your project requires completion of an Environmental Impact Statement (EIS) pursuant to 51.104(b)(1)(i). You may either complete an EIS or provide a waiver signed by the appropriate authority. Indicate your choice:

☐ Convert to an EIS

→ *Provide noise analysis, including noise level and data used to complete the analysis.*
Continue to Question 6.

☐ Provide waiver

→ *Provide an Environmental Impact Statement waiver from the Certifying Officer or the Assistant Secretary for Community Planning and Development per 24 CFR 51.104(b)(2) and noise analysis, including noise level and data used to complete the analysis.*
Continue to Question 6.

6. HUD strongly encourages mitigation be used to eliminate adverse noise impacts. Explain in detail the exact measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation. This information will be automatically included in the Mitigation summary for the environmental review.

☐ Mitigation as follows will be implemented:

→ *Provide drawings, specifications, and other materials as needed to describe the project's noise mitigation measures.*
Continue to the Worksheet Summary.

☐ No mitigation is necessary.

Explain why mitigation will not be made here:

→ *Continue to the Worksheet Summary.*

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

The subject property is located approximately 250 feet from Section Road approximately 866 feet from Montogomery Road, approximately 1,358 feet from a Ohio railway line, and approximately 6.7 miles from the Cincinatti Municipal/ Lunken Fied Airport, approximately 12.8 miles from Butler County Regional/ Hogan Field Airport, and approximately 13.3 miles from Clermont County Airport. There are no additional major roads within 1,000 feet, railways within 3,000 feet, or civil or military airports within fifteen (15) miles that would be considered noise sources to the subject property.

Based on the CEST level of review, a noise survey is not required to be conducted. However, HUD encourages noise attenuation measures to be incorporated into the project where appropriate. The scope of work for the rehabilitation will include the replacement of the windows and exterior doors and increasing attic insulation, which will provide greater noise attenuation than currently exists.

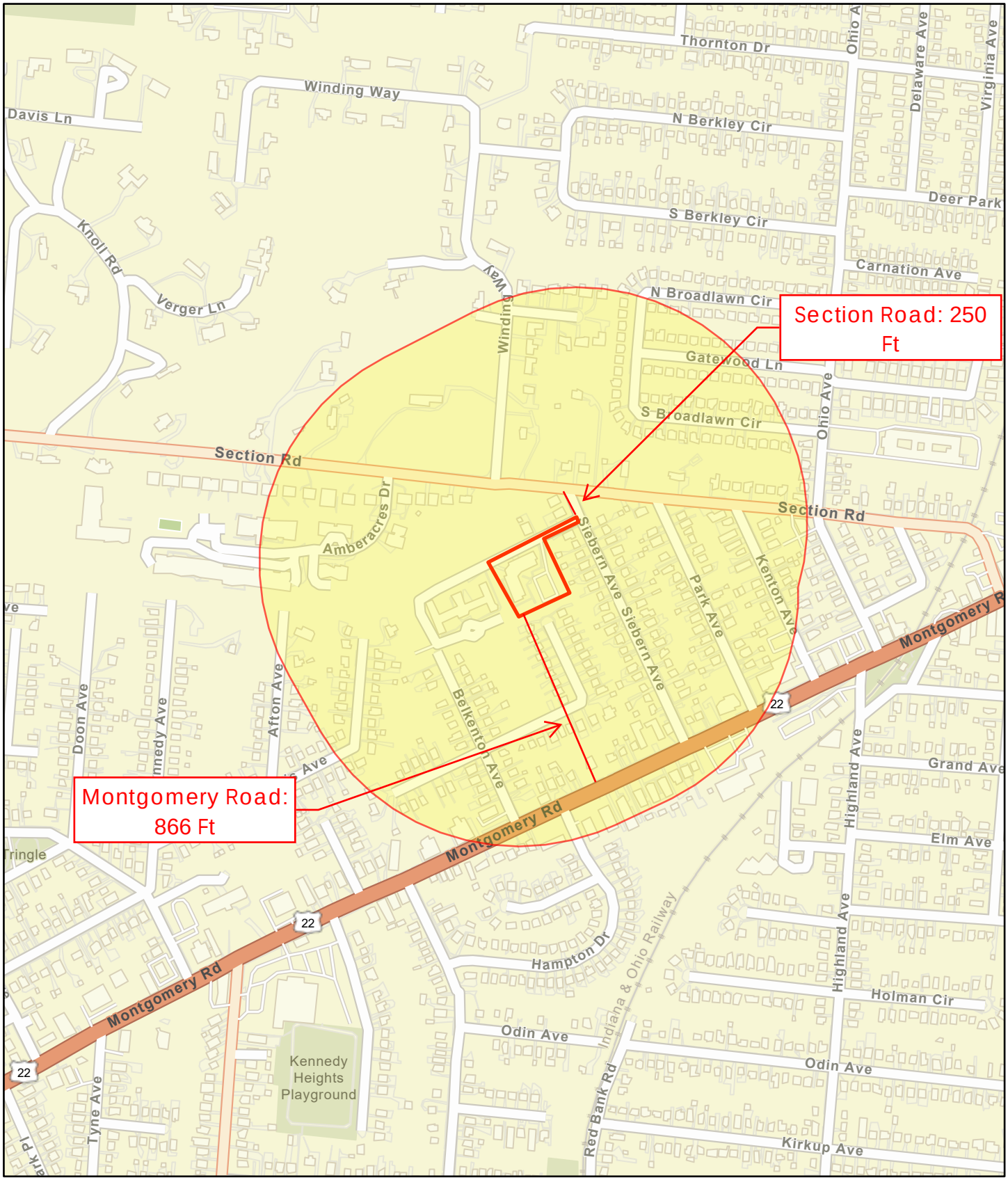
The project is in compliance with HUD's Noise regulations.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

Major Roads within 1000 Ft



October 2, 2025

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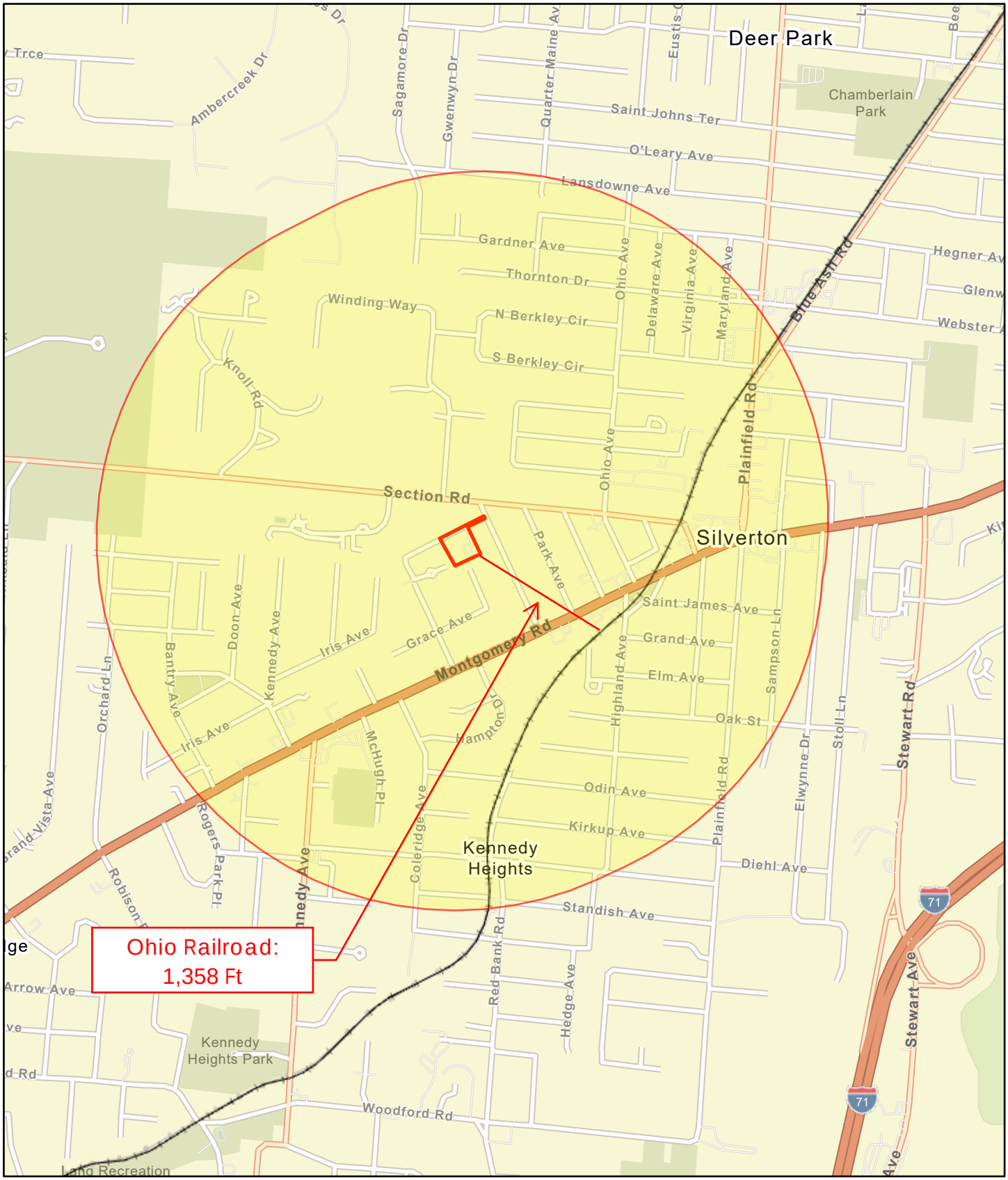
0 0.07 0.15 0.3 km

Project Buffer

Project 1

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

Railroads within 3000 Ft



October 2, 2025

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0 0.17 0.35 0.7 km

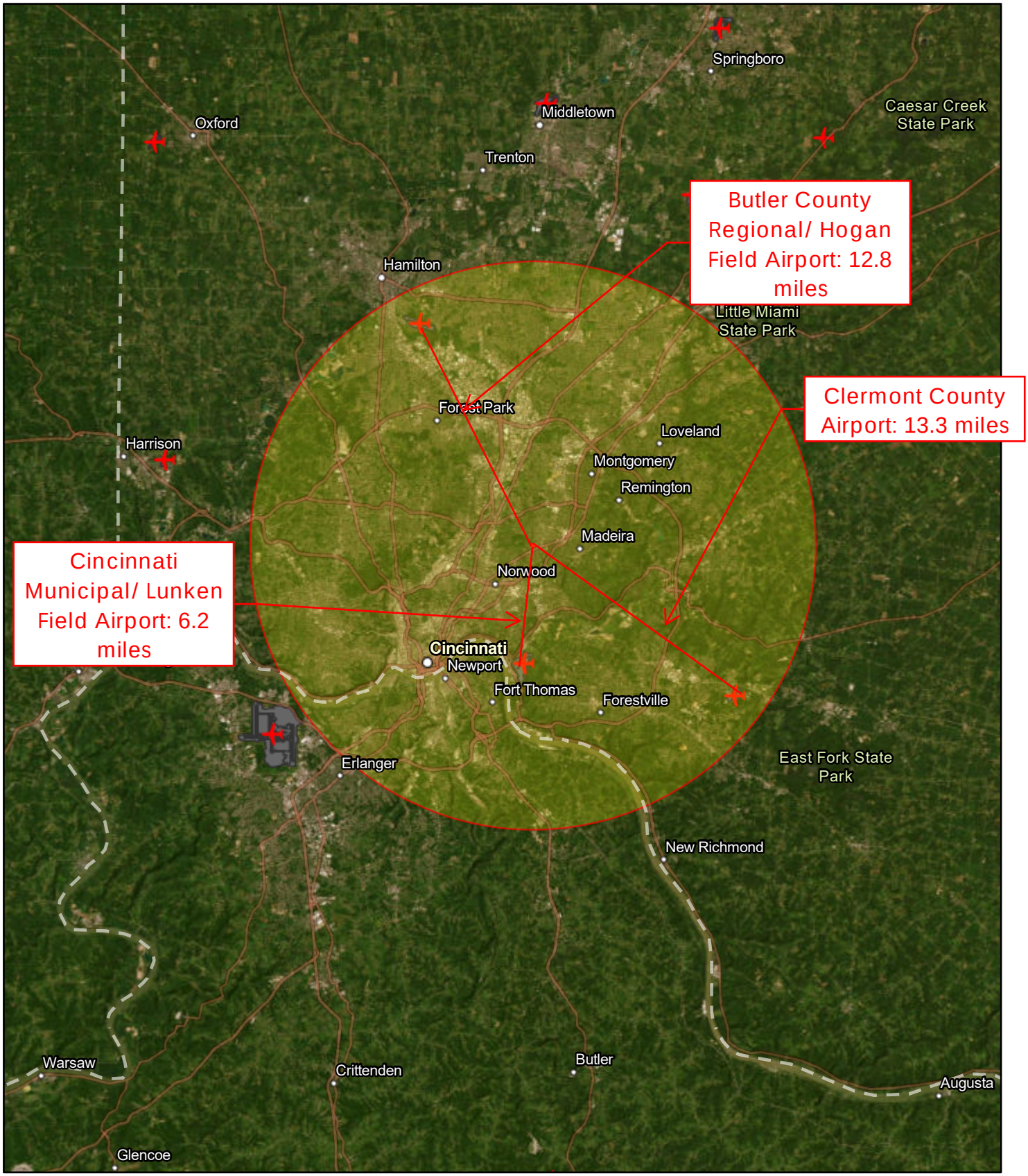
Project Buffer

Project 1

Railroads

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, EPA OEI

Airports within 15 miles



September 24, 2025

1:577,791

0 3.75 7.5 15 mi

0 5 10 20 km

Project Buffer

Project 1

Airport Points

Airport Polygons

Earthstar Geographics, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, EPA OEI

Airport Search Results

7 airports found near Cincinnati, OH

ID	CITY	AIRPORT NAME	WHERE
LUK	CINCINNATI, OH	CINCINNATI MUNICIPAL/LUNKEN FIELD AIRPORT	6.2 nm S
HAO	HAMILTON, OH	BUTLER COUNTY REGIONAL/HOGAN FIELD AIRPORT	11.1 nm NNW
I69	BATAVIA, OH	CLERMONT COUNTY AIRPORT	11.7 nm SE
CVG	COVINGTON, KY	CINCINNATI/NORTHERN KENTUCKY INTERNATIONAL AIRPORT	15.6 nm SW
I68	LEBANON, OH	WARREN COUNTY/JOHN LANE FIELD AIRPORT	16.9 nm NNE
I67	HARRISON, OH	CINCINNATI WEST AIRPORT	17.7 nm W
MWO	MIDDLETOWN, OH	MIDDLETOWN REGIONAL/HOOK FIELD AIRPORT	19.6 nm N

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Appendix O:

Sole Source Aquifers

Sole Source Aquifers (CEST and EA)

General requirements	Legislation	Regulation
The Safe Drinking Water Act of 1974 protects drinking water systems which are the sole or principal drinking water source for an area and which, if contaminated, would create a significant hazard to public health.	Safe Drinking Water Act of 1974 (42 U.S.C. 201, 300f et seq., and 21 U.S.C. 349)	40 CFR Part 149
Reference		
https://www.hudexchange.info/environmental-review/sole-source-aquifers		

1. Is the project located on a sole source aquifer (SSA)?

☑ No → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide documentation used to make your determination, such as a map of your project (or jurisdiction, if appropriate) in relation to the nearest SSA and its source area.*

☐ Yes → *Continue to Question 2.*

2. Does your project consist solely of acquisition, leasing, or rehabilitation of an existing building(s)?

☐ Yes → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

☐ No → *Continue to Question 3.*

3. Does your region have a memorandum of understanding (MOU) or other working agreement with EPA for HUD projects impacting a sole source aquifer?

Contact your Field or Regional Environmental Officer or visit the HUD webpage at the link above to determine if an MOU or agreement exists in your area.

☐ Yes → *Provide the MOU or agreement as part of your supporting documentation. Continue to Question 4.*

☐ No → *Continue to Question 5.*

4. Does your MOU or working agreement exclude your project from further review?

☐ Yes → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide documentation used to make your determination and document where your project fits within the MOU or agreement.*

☐ No → *Continue to Question 5.*

5. Will the proposed project contaminate the aquifer and create a significant hazard to public health?

Consult with your Regional EPA Office. Your consultation request should include detailed information about your proposed project and its relationship to the aquifer and associated streamflow source area. EPA will also want to know about water, storm water and waste water at the proposed project. Follow your MOU or working agreement or contact your Regional EPA office for specific information you may need to provide. EPA may request additional information if impacts to the aquifer are questionable after this information is submitted for review.

☐ No → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide your correspondence with the EPA and all documents used to make your determination.*

☐ Yes → *Work with EPA to develop mitigation measures. If mitigation measures are approved, attach correspondence with EPA and include the mitigation measures in your environmental review documents and project contracts. If EPA determines that the project continues to pose a significant risk to the aquifer, federal financial assistance must be denied. Continue to Question 6.*

6. In order to continue with the project, any threat must be mitigated, and all mitigation must be approved by the EPA. Explain in detail the proposed measures that can be implemented to mitigate for the impact or effect, including the timeline for implementation.

Continue to the Worksheet Summary below. Provide documentation of the consultation (including the Managing Agency's concurrence) and any other documentation used to make your determination.

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

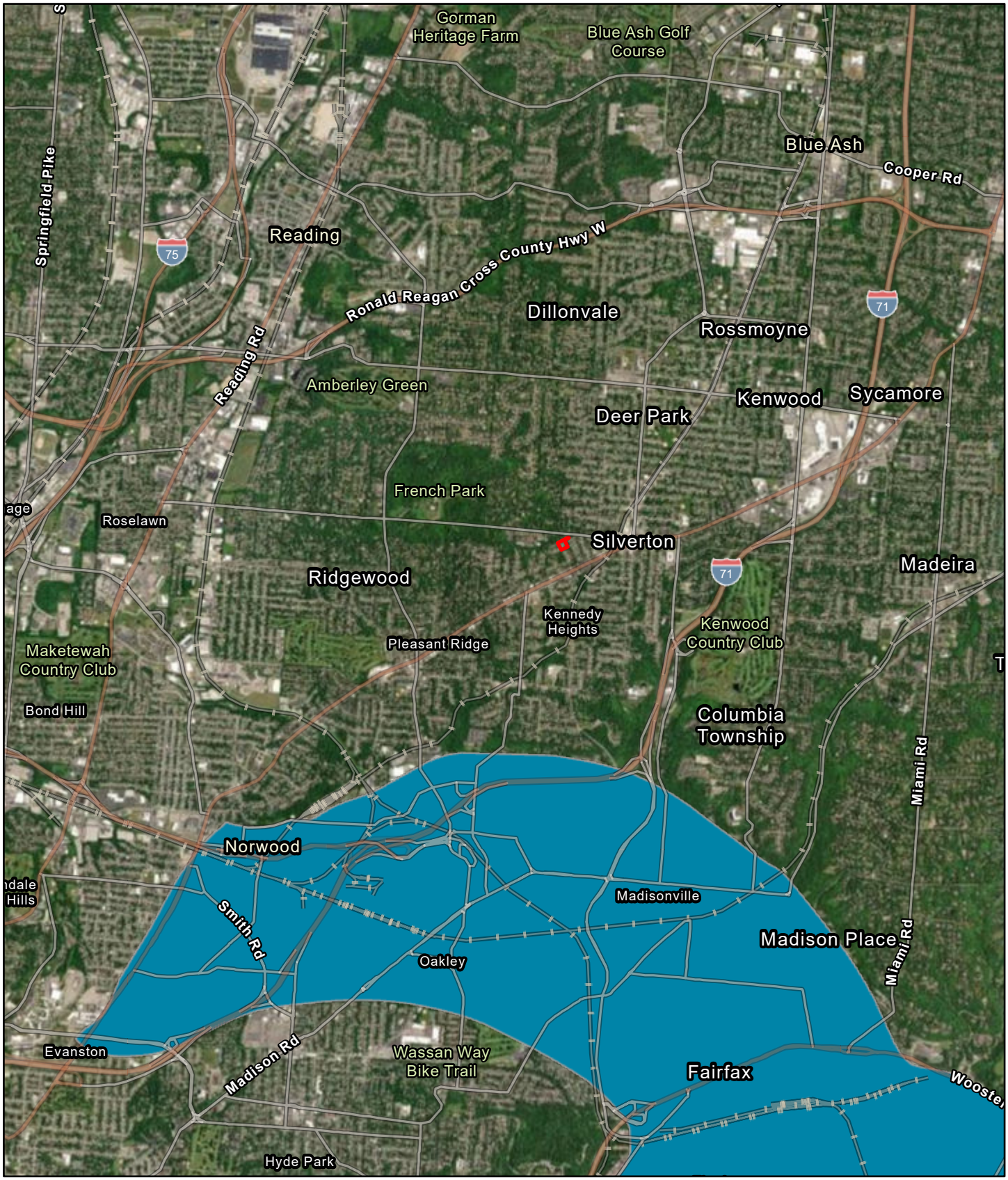
Based on the project description, the project consists of activities that are unlikely to have an adverse impact on groundwater resources. In addition, according to the Sole Source Aquifer layer obtained from EPA NEPAssist, accessed at http://nepassisttool.epa.gov/nepassist/entry.aspx, the subject property is not located within the boundaries of a Sole Source Aquifer. Therefore, the proposed undertaking is in conformance with HUD's Sole Source Aquifer requirements and no consultation nor mitigation measures are warranted.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

Sole Source Aquifers



September 24, 2025

1:72,224

0 0.5 1 2 mi

0 0.75 1.5 3 km

Project 1

Sole Source Aquifers

Earthstar Geographics, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

Appendix P:

Wetlands Protection

Wetlands (CEST and EA)

General requirements	Legislation	Regulation
Executive Order 11990 discourages that direct or indirect support of new construction impacting wetlands wherever there is a practicable alternative. The Fish and Wildlife Service's National Wetlands Inventory can be used as a primary screening tool, but observed or known wetlands not indicated on NWI maps must also be processed. Off-site impacts that result in draining, impounding, or destroying wetlands must also be processed.	Executive Order 11990	24 CFR 55.20 can be used for general guidance regarding the 8 Step Process.
Reference		
https://www.hudexchange.info/environmental-review/wetlands-protection		

1. Does this project involve new construction as defined in Executive Order 11990, expansion of a building's footprint, or ground disturbance?

The term "new construction" shall include draining, dredging, channelizing, filling, diking, impounding, and related activities and any structures or facilities begun or authorized after the effective date of the Order.

☑ No → Based on the response, the review is in compliance with this section.
Continue to the Worksheet Summary below.

☐ Yes → *Continue to Question 2.*

2. Will the new construction or other ground disturbance impact an on- or off-site wetland?

The term "wetlands" means those areas that are inundated by surface or ground water with a frequency sufficient to support, and under normal circumstances does or would support, a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds. Wetlands under E.O. 11990 include isolated and non-jurisdictional wetlands.

☐ No, a wetland will not be impacted in terms of E.O. 11990's definition of new construction.

→ Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map or any other relevant documentation to explain your determination.

☐ Yes, there is a wetland that be impacted in terms of E.O. 11990's definition of new construction

→ *You must determine that there are no practicable alternatives to wetlands development by completing the 8-Step Process.*
Provide a completed 8-Step Process as well as all documents used to make your determination, including a map. Be sure to include the early public notice and the final notice with your documentation.
Continue to Question 3.

3. For the project to be brought into compliance with this section, all adverse impacts must be mitigated. Explain in detail the exact measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.

Which of the following mitigation actions have been or will be taken? Select all that apply:

- ☐ Permeable surfaces
- ☐ Natural landscape enhancements that maintain or restore natural hydrology through infiltration
- ☐ Native plant species
- ☐ Bioswales
- ☐ Evapotranspiration
- ☐ Stormwater capture and reuse
- ☐ Green or vegetative roofs with drainage provisions
- ☐ Natural Resources Conservation Service conservation easements
- ☐ Compensatory mitigation

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

According to the USFWS National Wetlands Inventory Layer accessed at https://www.fws.gov/wetlands/data/mapper.html, there are no mapped wetland areas on the subject property. Based on visual observations during the site investigation performed by D3G, there are no suspected wetland areas present at the subject property. Therefore, the proposed undertaking will be in compliance with Executive Order (EO) 11990, Protection of Wetlands, as well as the requirements of Federal Register 24 CFR Parts 50, 55 and 58.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

U.S. Fish and Wildlife Service
National Wetlands Inventory

St. Theresa Village

September 24, 2025

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix Q:

Wild and Scenic Rivers

Wild and Scenic Rivers (CEST and EA)

General requirements	Legislation	Regulation
The Wild and Scenic Rivers Act provides federal protection for certain free-flowing, wild, scenic and recreational rivers designated as components or potential components of the National Wild and Scenic Rivers System (NWSRS) from the effects of construction or development.	The Wild and Scenic Rivers Act (16 U.S.C. 1271-1287), particularly section 7(b) and (c) (16 U.S.C. 1278(b) and (c))	36 CFR Part 297
Reference		
https://www.hudexchange.info/environmental-review/wild-and-scenic-rivers		

1. Is your project within proximity of a NWSRS river as defined below?

Wild & Scenic Rivers:

These rivers or river segments have been designated by Congress or by states (with the concurrence of the Secretary of the Interior) as wild, scenic, or recreational

Study Rivers: These rivers or river segments are being studied as a potential component of the Wild & Scenic River system.

Nationwide Rivers Inventory (NRI): The National Park Service has compiled and maintains the NRI, a register of river segments that potentially qualify as national wild, scenic, or recreational river areas

☑ No

Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide documentation used to make your determination, such as a map identifying the project site and its surrounding area or a list of rivers in your region in the Screen Summary at the conclusion of this screen.

☐ Yes, the project is in proximity of a Nationwide Rivers Inventory (NRI) River.

→ *Continue to Question 2.*

2. Could the project do *any* of the following?

- Have a direct and adverse effect within Wild and Scenic River Boundaries,
- Invade the area or unreasonably diminish the river outside Wild and Scenic River Boundaries, or
- Have an adverse effect on the natural, cultural, and/or recreational values of a NRI segment.

Consultation with the appropriate federal/state/local/tribal Managing Agency(s) is required, pursuant to Section 7 of the Act, to determine if the proposed project may have an adverse effect on a Wild & Scenic River or a Study River and, if so, to determine the appropriate avoidance or mitigation measures.

Note: Concurrence may be assumed if the Managing Agency does not respond within 30 days; however, you are still obligated to avoid or mitigate adverse effects on the rivers identified in the NWSRS.

☐ No, the Managing Agency has concurred that the proposed project will not alter, directly, or indirectly, any of the characteristics that qualifies or potentially qualifies the river for inclusion in the NWSRS.

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide documentation of the consultation (including the Managing Agency's concurrence) and any other documentation used to make your determination.*

☐ Yes, the Managing Agency was consulted and the proposed project may alter, directly, or indirectly, any of the characteristics that qualifies or potentially qualifies the river for inclusion in the NWSRS.
→ *Continue to Question 3.*

3. For the project to be brought into compliance with this section, all adverse impacts must be mitigated. Explain in detail the proposed measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.
→ *Continue to the Worksheet Summary below. Provide documentation of the consultation (including the Managing Agency's concurrence) and any other documentation used to make your determination.*

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

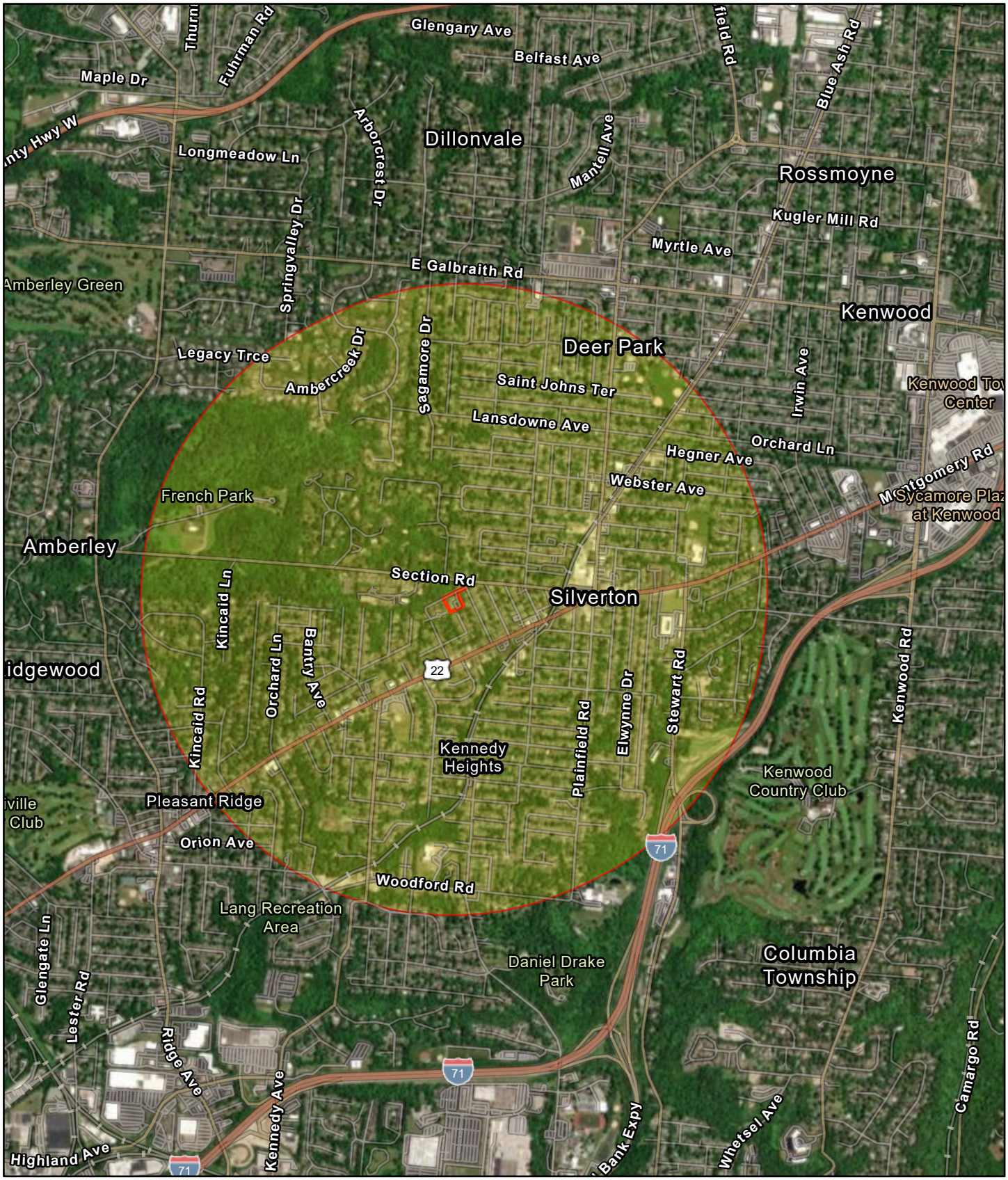
According to the National Wild and Scenic Rivers website accessed at https://www.rivers.gov/map.php, there are no Wild and Scenic Rivers in the vicinity of the subject property. In addition, according to the Nationwide Rivers Inventory list accessed at https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm, there are no Ohio Rivers listed that are upstream or downstream of the subject property within one (1) mile. Therefore, the subject property is in conformance with HUD's Wild and Scenic Rivers regulations and no consultation nor mitigation measures are warranted.

Are formal compliance steps or mitigation required?

☐ Yes

☑ No

Wild and Scenic Rivers within 1 mile



September 24, 2025

1:36,112

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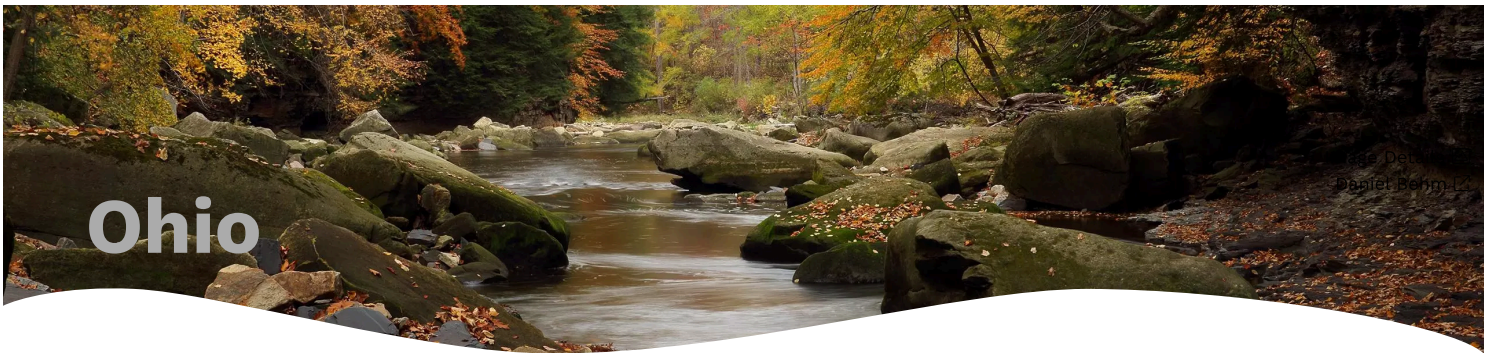
Project Buffer

Project 1

Wild and Scenic Rivers

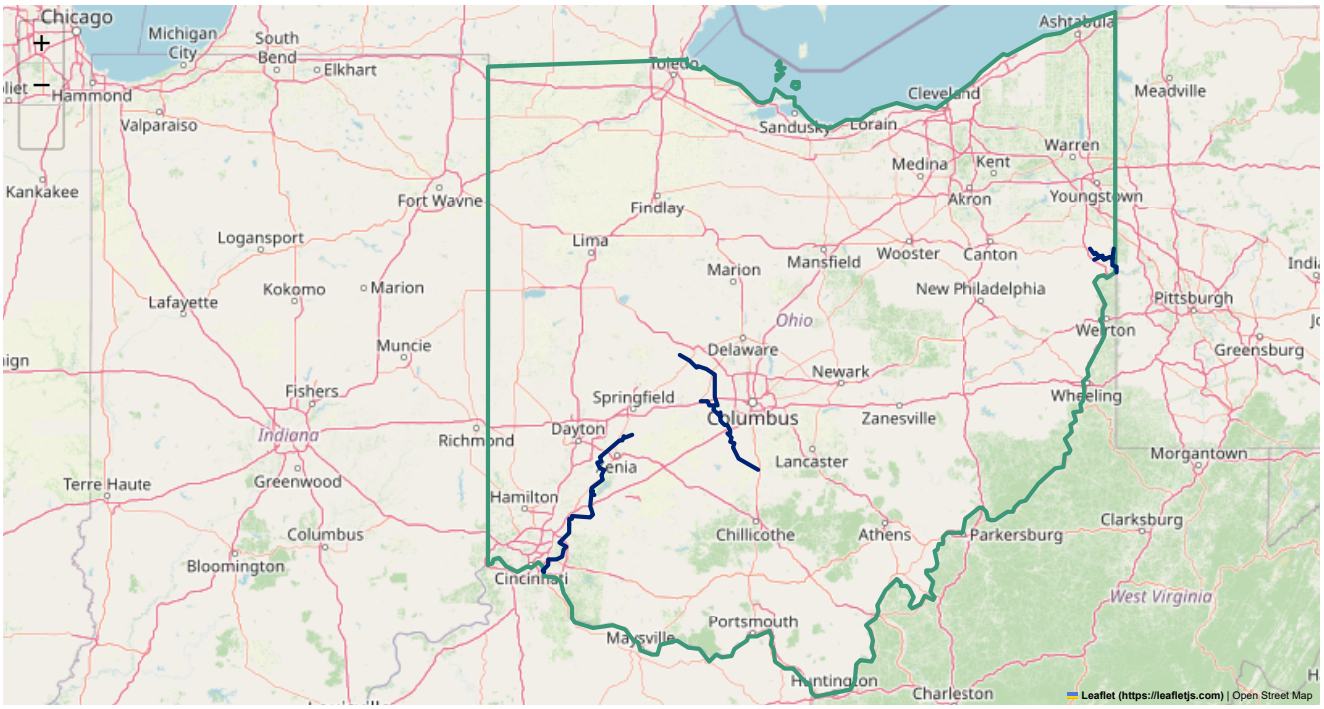
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Maxar



The state of Ohio takes its name from the Ohio River, which, in turn, originated from the Seneca word ohi:yo', meaning "good river." Ohio is a water-rich state bounded on the south by the Ohio River and the north by Lake Erie. Thousands of miles of inland streams and rivers contribute to the quality of life of Ohio's citizens.

Significant rivers within the state include the Cuyahoga River, Great Miami River, Maumee River, Muskingum River, and Scioto River. The rivers in the northern part of the state drain into the northern Atlantic Ocean via Lake Erie and the St. Lawrence River, and the rivers in the southern part of the state drain into the Gulf of Mexico via the Ohio River and then the Mississippi.

Ohio has approximately 29,113 miles of river, of which 212.9 miles are designated as wild and scenic—less than 1% of the state's river miles. Many of these rivers first started out in the **Ohio Scenic Rivers Program (https://ohiodnr.gov/discover-and-learn/safety-conservation/about-ODNR/nature-preserves/scenic-rivers/list-ohio-scenic-rivers/)**.



Rivers In Ohio

(/rivers/rivers/river/big-little-darby)

(/rivers/rivers/river/little-beaver)

Big & Little Darby Creeks (/rivers/rivers/river/big-little-darby)
Ohio (/rivers/rivers/river/big-little-darby)

Little Beaver Creek (/rivers/rivers/river/little-beaver)
Ohio (/rivers/rivers/river/little-beaver)

(/rivers/rivers/river/little-miami)

Little Miami River (/rivers/rivers/river/little-miami)
Ohio (/rivers/rivers/river/little-miami)

PARTNERS

Bureau of Land Management (https://blm.gov/programs/national-conservation-lands/wild-and-scenic-rivers)

National Park Service (https://www.nps.gov/orgs/1912/index.html)

NPS Partnership Rivers (https://www.nps.gov/orgs/1912/partnership-wild-and-scenic-rivers.htm)

U.S. Fish & Wildlife Service (https://www.fws.gov/story/wild-and-scenic-rivers)

U.S. Forest Service (https://www.fs.usda.gov/managing-land/wild-scenic-rivers)

River Management Society (http://river-management.org/)

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Interagency Council (/council)

Stewardship (/stewardship)

News (/news)

Videos (/video)

Vulnerability Disclosure Policy (/vulnerability-disclosure-policy)

Nationwide Rivers Inventory

A listing of free-flowing river segments in the U.S. believed to possess one or more "outstandingly remarkable" values

Search by River Name, Federal Management Entities, Management Area, or State

Legend

Nationwide Rivers Inventory (NPS)

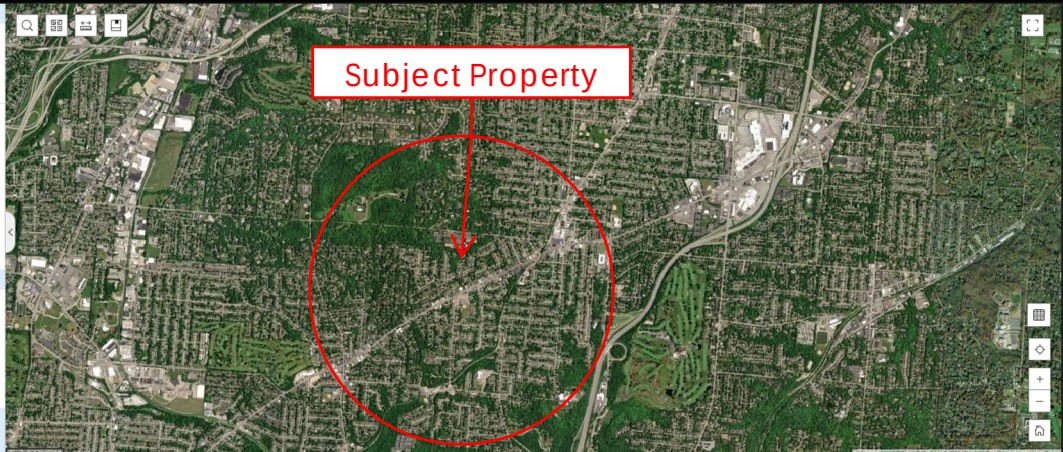
National Wild and Scenic River System (USDA Forest Service)

Add Data to Map

There is currently no added data.

+ Click to add data

↓ Download NRI Data



Ohio Segments

Hector Santiago
National Park Service
Midwest Regional Office
601 Riverside Drive
Omaha, Nebraska 68102
(402) 661-1848

Authorizations / History / Eligibility Descriptions / Outstandingly Remarkable Values / Potential Classification / Wild and Scenic Rivers System

Return to NRI Page

River	County	Reach	Length (miles)	Year Listed / Updated	Potential Classification	ORVs	Description	Other States
Auglaize River	Auglaize, Allen, Putnam, Paulding, Defiance	Oakwood to Ft. Jennings (26 river miles); Scott crossing to Wapakonetta (29 rm); Wapakonetta to source (26 rm)	81	1982		R, F, W, H, O	Has large diversity of southern floodplain and mudflat species of plants. Paralleled by Buckeye Trail. Used for canoeing. Good fishing. Historical significance with Ft. Amanda and Defiance. Flows through NW Ohio agricultural area. Provides good fishing for croppies and bullhead, and good waterfowl hunting.	
Big Darby Creek	Champaign, Logan, Franklin, Union, Madison	Source to I-70 (42 river miles; I-70 to SR 40 (5 rm)	47	1982		R, F, W	Clear, fast flowing water. Excellent canoeing. Small mouth bass fishing. Wildlife observation popular. Flows near city of Columbus. One of state's least polluted streams with unusually large faunal diversity.	
Big Darby Creek	Franklin, Pickway	From Confluence with Scioto River to Rt. 40 in Franklin County	40	1982		S, R, G, F, W	River meanders through level to gently rolling watershed. It is characterized by quiet pools dispersed with riffles and runs. Numerous scenic wooded high bluffs are interspersed with pastoral settings along much of the river. The stream has over 1 million people within short driving distance. It is presently under study for inclusion in State Scenic Rivers System. Has state endangered species cob shell, club shell, northern riffle shell, Simpsons shell, river redhorse, northern brook lamprey, Scioto madtom, northern madtom, tippecanoe darter, spotted darber, blacknose shiner, eastern darter and slender darter. Threatened species streamline chub, bluebreast darter.	
Black River, East Branch	Lorain, Medina	Grafton to source	24	1982		S, R, H	A somewhat scenic stream tributary to the Black River near metropolitan Cleveland. Flows in part through hilly area with steep hills and graduated valley.	
Black River, West Branch	Lorain, Huron	River mile 7 to source	41	1982		S, G, W, H	Contains state endangered species, Big Mouth Shiner. Numerous rock out-croppings and very large rocks. Good recreational river used for outdoor nature study. Low waterfalls and caves. Old dam, gristmill and Indian burial ground at Elyria.	
Blanchard River	Hancock, Hardin, Putnam	Ottawa to Findlay (26 river miles); Mt. Blanchard to source (28 rm)	54	1982		R, H, C	Very little visible development. Banks mostly wooded. A popular canoe stream. Many 19th century buildings along river being restored. Flows through gently rolling central Ohio farmland. Provided inspiration for composition of song "Down by the Old Mill Stream".	
Chagrin River	Lake, Geauga	Ingalls airport to west edge of Chagrin Falls	7	1982		S, R, W, O	Has state endangered species, American brook, lamprey, pugnose minnow, long nose dace. Canoeing, fishing, hiking. Steep cliffs and ravines. Near Cleveland Metropolitan area. Unusual scenic beauty.	
Conneaut Creek	Ashtabula	SW limits of city of Conneaut to Pennside, PA	50	1982		H, O	See Conneaut Cree, PA comments.	PA
Cuyahoga River	Cuyahoga, Summit, Portage	From end of canal to dam at Penninsula (8 river miles); Lake Rockwell to Montea. Poineer trail crossing to channelization (11 rm); E. Br. Reservoir to source of E. Br. (7 rm)	26	1982		S, R, F	Designated segment of State Scenic Rivers System. Swamp forest vegetation. Two Ohio endangered species present, Iowa darter and lake chubsucker. Excellent canoeing stream. Small and large mouth bass and northern pike fishing. A scenic stream flowing through woods and farmland with some marsh and wetland. Near cities of Cleveland and Akron.	

Four Mile Creek	Butler	From Acton Lake to confluence with Seven Mile Creek	18	1982		S, R, F	A small southwestern Ohio stream, only seasonably canoeable. Good to excellent water quality with good fishing and small game hunting. Moderate existing recreational use. Mainly bordered by tree cover with few cultivated fields to the waters edge. Near Cincinnati Metro area. Scattered development along stream.	
Grand	Lake and Ashtabula	U.S. Highway 322 in Ashatabula County downstream to Norfolk and Western Railroad in Lake County	31	1995	S	S, G, F	The river is classified as scenic from Route 322 to Harper's Field Covered Bridge and classified as wild from Harper's Field Covered Bridge to Norfolk and Western Railroad tressel. Scenic resources include a well wooded corridor with shale cliffs; Recreational resources consist of excellent canoeing and fishing opportunities; Fishery resources provide high quality Northern brook lamprey: Wildlife resources can be found in the extensive wetlands. The Grand is a designated wild and scenic river in the Ohio Scenic River program.	
Great Miami River	Hamilton, Butler, Warren, Montgomery, Miami	Mouth to Dayton (56 river miles); Dayton to Troy (excluding Hamilton and Middletown areas) (20 rm)	76	1982		S, R, H, C	Rt. of Buckeye and North Country Trails, Historical significance as "Highway of Indians and Pioneers". Scenic stream located near historic Miami and Erie canal. Indian mounds scattered along stream. Popular fishing river. Area near mouth used extensively for duck hunting.	
Hocking River	Athens	Chauncey to Athens (12 river miles); Athens to confluence with Ohio River (20 rm)	32	1982		S, R, H	Flows through small towns and rural areas. Some scenic parklands. Most of adjacent land forested. Popular canoe stream. Flows through Hocking Hills, a very scenic, popular tourist area. Fishing and watersports near mouth. Buckeye Trail crosses river. Several historic sites including Ft. Gower (revoluntionary war era).	
Huron River, West Branch	Huron	From bridge crossing near Standardsburg Sourth of Monroeville to Skinner Road north of Plymouth.	25	1982		R	A meandering stream flowing through a moderately wooded corridor. Some high banks. Scattered housing. The stream has good water quality, but is generally narrow and somewhat silted. Moderate fishing use. Seasonably canoeable.	
Kokosing River	Morrow, Knox, Coshocton	From confluence with Mohican River to Mt. Vernon (25 river miles); From Mt. Vernon to source (32 rm)	57	1982		R, G, F	Located in east central Ohio and flows through mostly agricultural land. Had cliffs and large boulders throughout its length. A popular canoe stream with good small mouth bass fishing. Under consideration for State Scenic Rivers System.	

Little Muskingum River	Washington, Monroe	Marietta to Woodsfield	35	1982		S, R, F, H	Flows through very scenic sparsely populated hill country of southeastern Ohio. An excelllent canoeing and fishing stream located partly in the Wayne National Forest. Several covered bridges contribute to the area's personality. The banks are mostly wooded with some bottomland farming. One of the few streams in the state with Ohio River muskie.	
Loramie Creek	Shelby	Mouth to Mill Creek	5	1982		R, H, C	Route of Buckeye and North Country Trails. Near Miami and Erie Canal, numerous locks, aqueducts and pioneer dwellings. Outstanding historic and archeologic significance with Ft. Pickaway and the Miami and Erie Canal. Buckeye trail passes through area. Canoeing is popular and fishing use is increasing due to improved water quality.	
Mad River	Greene, Clark	From Montogomery-Greene County line to Tremont city	20	1982		R, F, H, C	Two state endangered species. Excellent canoeing stream. One of the few trout streams in the state. Rich in Ohio history with Simon Kenton Farm, Indian burial sites, Shawnee Indian Village, George Rogers Clark Park, U.S. Air Force Museum and Wright Brothers Park nearby. Buckeye trail uses some of corridor.	
Mill Creek	Ashtabula	From the confluence with the Grand River to the headwaters	31	1995	S	S, G, F	Mill Creek meets Ohio State River Inventory requirements for study. Scenic-High shale cliffs, well-wooded, upper stream area woods and pastoral areas; Fishery-Northern brook lamprey, an endangered species.	
Mohican River	Ashland, Holmes, Knox	From confluence with Clear Fork to southernmost crossing of Holmes-Knox County line	20	1982		R, W, H	Good canoeing stream. Presently under consideration for inclusion in State Scenic Rivers System. Area rich in Indian lore. Has state endangered species cob shell, club shell, fan shell, ridged pocketbook, bullhead, long solid.	
Ohio River	Columbiana	From Ohio-Pennsylvania state line to Wellsville	18	1982		S, R, H	A broad interstate river used extensively for recreational boating, canoeing and fishing. In this area it flows through scenic hill country in Ohio and Kentucky with some cliffs and rock outcroppings. Considerable historic and archeologic values along river. Used extensively in 19th century by settlers and early explorers. Many stream side recreational facilities available. Flows through Cinncinnati and several other smaller cities.	WV

Ohio River	Adams, Brown	From Rome to Morgansville, KY	21	1982		S, R, H	A broad interstate river used extensively for recreational boating, canoeing and fishing. In this area it flows through scenic hill country in Ohio and Kentucky with some cliffs and rock outcroppings. Considerable historic and archaeologic values along river. Used extensively in 19th century by settlers and early explorers. Many stream side recreational facilities available. Flows through Cinncinatti and several other smaller cities.	KY
Paint Creek	Ross, Highland, Fayette, Madison	River mile 5 to Point Creek Lake Dam (32 rm); Greenfield to Washington Court House (18 rm); Washington Court House to source (32 rm)	82	1982		S, G, H, O	Scenic limestone gorge below Paint Creek dam. Seip Mound historic and archeologic area. Great diversity of plant species on bluffs. Has state threatened species-streamline chub, gravel chub, bluebreast darter. Prehistoric burial mounds present.	
Pymatuning Creek	Ashtabula and Trumbull	From the headwaters located South of Ayers Road and East of the Conrail tracksdownstream to Orangeville Western Corporate Boundary, one mile West of Pennsylvania line.	32		S	S, F, W	Listed in Ohio State River Inventory as a subject for study for designation. Scenic-Wooded, extensive wetlands; Fishery-Aquatic community includes Pleuroblema clava, or clubshell, an endangered mollusc; Wildlife-Bald eagle nesting area, state wildlife area and site of a state nature preserve.	
Salt Creek	Ross, Vinton, Hocking	From town of Reed to confluence with Scioto River	25	1982		S, R, W	Extremely diverse fauna. Excellent canoeing. Undisturbed and very scenic river. Small mouth bass and other fishing. One of the few unpolluted natural streams in the state. Has state endangered species yellow sand shell and fragile heel splitter.	
Sandusky River	Wyandot, Crawford	From U.S. 23 SE of Upper Sandusky to Kestetter Road west of Bucyrus	25	1982		R	The Sandusky flows north into Lake Erie east of Toledo. This portion of stream only seasonally canoeable. Moderate hunting and fishing use. Considerable agricultural lands to rivers edge. Has endangered species, northern riffle shell.	
Sandusky River	Sandusky	From mouth at Lake Erie to Fremont (14 river miles); Freemont to Tiffin (23 rm); From U.S. 224 at Tiffin to St. John bridge in Sec. 23, TIN, R14E. (7 rm); From the spillway at Indian Mill Park downstream to Upper Sandusky (26 rm)	70	1982		R, H	Included in the State Scenic River System. Wood duck hunting in area good. Rises in north-central part of state and flows north to Lake Erie through generally flat agricultural land. Whittaker home site, first non-Indian family in Ohio, is located along river. Used extensively for power boating and water skiing. Extensive marshes near mouth receive heavy waterfowl hunting use.	

Scioto River	Scioto, Pike, Ross, Pickaway, Franklin, Delaware, Marlon, Hardin	Chillicothe to Circleville (16 river miles); Circleville to Columbus(24 rm); Bellpoint to Kenton (53 rm)	93	1982		R, H	A mostly slow, meandering stream with generally forested banks. Archeological value, including five National Register sites and a National Historic Monument. Many Indian burial mounds. Hunting along the corridor is good. Chillicothe area referred to as "Capitol of Prehistory". Paralleled in part by remnants of old Ohio and Erie Canal. Has state endangered species Ohio lamprey, shortnose gar, blue sucker, mountain madtom, river darter, paddlefish and northern madtom. Threatened species gravel chub.	
St. Mary's River	Mercer, Auglaize	From Rockford to Barber-Warner Road in Auglaize County	25	1982		R	A meandering western Ohio river extending into Indiana. Flows through mainly flat farm country. Good hunting and fishing available with moderate use. Good water quality. Some heavily wooded areas along stream, mainly in Oxbow areas. Canoeable but does not receive much use.	
Stillwater River	Montgomery, Miami, Darke	Englewood Reservoir to Penn Central RR in Covington (24 river miles); Covington to Ansonia (31 river miles)	55	1982		R, F, O	A gentle canoeing stream with generally wooded banks. Flows through central Ohio farm lands and City of Dayton. Some protection offered by Stillwater River Association. A National Recreation Trail is proposed on lower part of City of Dayton.	
Tuscarawas River	Stark, Tuscarawas	Canal Fulton to Massillon (8 river miles); Massillon to Dover (20 rm); Dover to New Philadelphia (5 rm); New Philadelphia to New Comerstown (20 rm)	53	1982		S, R, H	The Tuscarawas is a feeder stream to the Muskingum River. Provides a long canoe trip when combined with parent stream. Flows through east-central Ohio rolling farmland. Has rich historic values, including Ohio and Erie Canal. Tuscarawas Valley has considerable scenic beauty with lowlands bordered by steep hills.	
Twin Creek	Preble, Montgomery	From Lewisburg downstream to Germantown dam	41	1982		R	Located near Dayton metropolitan area in heavy agriculture area. Banks somewhat wooded and steep in places. Moderate hunting and fishing use. Very little public land. Access is a problem. A generally shallow and narrow stream. Seasonally canoeable.	
Vermillion River	Huron, Erie	From Clarksfield to the Ohio Turnpike and east fork of the Vermilion from confluence with Vermillion to Orphanage Road	25	1982		S, R, F	Rises in north central Ohio and empties into Lake Erie near the western edge of the Cleveland metropolitan area. Exceptional warm water species habitat with good water quality. Recreational use moderate with good opportunity for hunting and fishing. This segment seasonally canoeable. Main stem and east branch both flow through wooded corridors with steep hills.	

Vermillion River	Lorain, Erie, Huron	From mouth at Lake Erie to river mile 7 (7 river miles); from river mile 7 to Ohio Turnpike (5 rm); From W. Clarksfield to Huron-Ashland County line (16 rm)	28	1982		R, G, W	See initial comments.	
White Oak Creek	Brown	From Ohio River to confluence with North and East Forks of White Oak Creek	31	1982		S, R, F	A small stream flowing through scenic southern Ohio hill country into the Ohio River. Seasonally canoeable with good to excellent hunting and fishing available. Receives moderate recreational use due to poor access. Corridor 99% privately owned. Has good water quality. Exceptional warm water habitat. Corridor fairly well wooded.	

Appendix R:

Housing Requirements

OMB No. 2506-0177
(exp.4/30/2018)

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-1000

This Worksheet is designed to be used by those "Partners" (including Public Housing Authorities, consultants, contractors, and nonprofits) who assist Responsible Entities and HUD in preparing environmental reviews, but legally cannot take full responsibilities for these reviews themselves. Responsible Entities and HUD should use the RE/HUD version of the Worksheet.

Housing Requirements

Many Housing Division programs have additional requirements beyond those listed at 50.4. Some of these relate to compliance with 50.3(i) and others relate to site nuisances and hazards.

Requirements for evaluating additional housing requirements vary by program. Refer to the appropriate guidance for your program area (i.e. the Multifamily Accelerated Processing (MAP) guide, Chapter 7 of the Healthcare Mortgage Insurance Handbook, etc.) for specific requirements.

Lead-based paint

Lead-based paint may be present in buildings built prior to 1978. Guidance materials related to lead-based paint, including a helpful online Lead Rule Compliance Advisor, may found by following on HUD's website. Buildings constructed in 1978 or later do not require lead-based paint testing. Refer to specific program guidance for additional exemptions and requirements.

Was a lead-based paint inspection or survey performed by the appropriate certified lead professional?

☐ Yes. → *Continue to next question.*

☐ No, because the project was previously deemed to be lead free. → *Provide all lead free certificates.*

☑ No, because the project does not involve any buildings constructed prior to 1978. → *Provide documentation of construction date(s).*

☐ No, because program guidance does not require testing for this type of project. (For example: HUD's lead-based paint requirements at 24 CFR Part 35 do not apply to housing designated exclusively for the elderly or persons with disabilities, unless a child of less than 6 years of age resides or is expected to reside in such housing. In addition, the requirements do not apply to 0-bedroom dwelling units.)
→ *Explain determination below.*

Was lead-based paint identified on site?

☐ Yes. → *Refer to program guidance for remediation requirements. Describe the testing procedure and findings in the textbox below and any necessary mitigation measures in the Mitigation textbox at the bottom of this screen. Upload all documentation below.*

☐ No, because the project was previously deemed to be lead free. → *Provide all testing documents demonstrating that no lead-based paint was found.*

Describe how exemption or compliance was met and provide any relevant documents such as reports, surveys, and letters.

The facility was constructed in 1996, after the 1978 ban on lead-based paint (LBP); therefore, LBP is not suspected to be present at the subject property.

Radon

Many Housing Programs require radon testing and mitigation. Radon is a colorless, odorless gas that can enter the air inside of buildings. Refer to specific program guidance for testing and mitigation requirements.

Was radon testing performed following the appropriate and latest ANSI-AARST standard?

☑ Yes. → *Continue to next question.*

☐ No, because program guidance does not require testing for this type of project. → *Note that radon testing is encouraged for all HUD projects, even where it is not required. Explain why radon testing was not completed below.*

Did testing identify one or more units with radon levels above the EPA action level for mitigation?

☐ Yes. → *Refer to program guidance for remediation requirements. Describe the testing procedure, findings, and mitigation measures below and provide all documentation.*

☑ No → *Provide all testing documents demonstrating that radon was not found above EPA action levels for mitigation.*

Describe how exemption or compliance was met and provide any relevant documents such as reports, surveys, and letters.

The subject property is located in an EPA Radon Zone 1, designated as an area of high radon gas potential with an average indoor radon level above 4 picocuries per liter (pCi/L) of air. Mr. Shad Evans, an AARST/NRPP certified radon technician (certification #107790-RMP) and State of Ohio licensed Radon Mitigation Specialist (license #RS157) with Protect Environmental, conducted short-term radon gas testing at the subject property on behalf of D3G from September 26-29, 2025. In accordance with HUD guidelines, testing was conducted in accordance with the ANSI/AARST MA-MFLB-2023, Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial and Mixed-Use Buildings 100% of the ground floor units and common areas. In addition, at least 10% of the units on each of the upper-level floors were tested. At least one (1) activated charcoal testing device was placed in each of the tested units for an undisturbed testing period of 48 to 72 hours. QA/QC samples (field blanks and duplicates) were also submitted in accordance with AARST guidelines. The tenants were requested to maintain closed-building conditions for twelve (12) hours prior to and during the testing. Closed building conditions appeared to have been maintained.

At the end of the recorded sampling period, the testing devices were collected and logged onto chain of custody forms and then submitted to an AARST/NRPP certified and State of Ohio licensed radon analytical laboratory, Air Chek, Inc. (certification/license #101138AL and RL10, respectively). Testing devices were analyzed via the EPA Method #402-R-92-004. Achieved results were compared to the EPA radon action limit of 4.0 pCi/L of air.

Samples collected within the facility determined that radon levels were below the EPA action level within the sampled areas during the sampling episode. The results ranged from < 0.3 pCi/L to 2.3 pCi/L. Therefore, no further action is required at this time regarding radon gas.

A copy of the Radon Gas Inspection Report, which details all sampling results, is included in Appendix K of the Phase I ESA, which is included under separate cover.

Asbestos

Asbestos may be present in older buildings and in roofing materials through the present day. Refer to specific program guidance for date thresholds, additional exemptions and requirements.

Was a comprehensive asbestos building survey performed pursuant to the relevant requirements of the latest ASTM standard?

☑ Yes

☐ No, because the project meets a date threshold in program guidance. Provide documentation of construction date(s) and how this fits program guidance below. → *Provide documentation of construction date(s).*

☐ No, because program guidance does not require testing for this type of project. → *Explain in textbox below.*

Was asbestos identified on site?

☐ Yes, friable or damaged asbestos was identified. → *Refer to program guidance for remediation requirements. Describe the testing procedure, findings, and mitigation measures below and provide all documentation.*

☐ Yes, asbestos was identified, but it was not friable or damaged. → *Refer to program guidance for remediation requirements. Describe the testing procedure, findings, and mitigation measures below and provide all documentation.*

☑ No → *Provide all testing documents demonstrating that no asbestos was found.*

Describe how exemption or compliance was met and provide any relevant documents such as reports, surveys, and letters.

According to HUD guidelines, buildings constructed prior to 1989 must be inspected by a qualified asbestos inspector. The facility was constructed in 1996; therefore, an asbestos inspection is not required for HUD compliance purposes. However, compliance with 40 CFR 61 Subpart M and State of Ohio asbestos regulations prior to any renovation or demolition activities at the subject property. In addition, according to HUD guidelines, buildings built in 1989 or later must provide knowledge of asbestos use at the property and to verify the composition of roofing materials. According to Mr. Kassidi Boening, Vice President and the Current Landowner Representative, he is not aware of any asbestos-containing materials (ACMs) at the subject property. According to D3G's Capital Needs Assessment (CNA), roofing assemblies consist of pitched roof assemblies constructed of conventional wood framing surfaced with structural wood sheathing, felt paper, and asphalt shingles, along with a smaller flat roof assembly supported by open web wood joists with structural wood sheathing, and a mechanically fastened rubber membrane. The roofing assembly has the potential to contain asbestos; therefore, sampling of the roofing materials is recommended prior to future roof replacement activities.

The facility is proposed for renovation. Therefore, D3G contracted Environmental Concerns, Inc. to perform a pre-renovation asbestos survey at the subject property. Mr. Pete Gibson, a State of Ohio licensed Asbestos

Hazard Evaluation Specialist (license #ES35718) with Environmental Concerns, Inc., performed a comprehensive pre-renovation asbestos survey of the subject property structure on September 22, 2025 on behalf of D3G. The inspection and sampling activities were conducted in accordance with the EPA National Emissions Standards for Hazardous Air Pollutants (NESHAP) 40 CFR 763 Subpart M, the ASTM Standard Practice for Comprehensive Asbestos Building Surveys Designation: E 2356-18 (ASTM E 2356-18) for Baseline Surveys and State of Ohio asbestos regulations. Sampled materials included drywall, joint compound, vinyl flooring and covebase materials and associated mastics, sink undercoating materials, interior and exterior caulking materials, and roofing materials. Samples were initially analyzed via Polarized Light Microscopy (PLM) via EPA Method 600/M4?82?020. In addition, in accordance with the analytical requirements of the ASTM E 2356?18 standard, the laboratory analyzed via Transmission Electron Microscopy (TEM) one of each non-friable organically bound (NOB) material (i.e. caulking materials, roofing materials, vinyl flooring and covebase materials, mastics and sink undercoating materials) which was not identified as an ACM via PLM analysis. A total of forty-nine (49) multi-layered samples were collected and analyzed via PLM and twelve (12) samples of NOB materials were re-analyzed via TEM. An ACM is defined as containing greater than 1% asbestos. None of the sampled materials were identified as ACMs.

The Asbestos Inspection Report is included in Appendix J of the Phase I ESA, which is included under separate cover.

If suspect ACMs are encountered during renovation activities which have not been previously sampled, they should be sampled by an appropriately licensed asbestos inspector prior to impaction.

Additional Nuisances and Hazards

Many Housing Programs have additional requirements with respect to common nuisances and hazards. These include High Pressure Pipelines; Fall Hazards (High Voltage Transmission Lines and Support Structures); Oil or Gas Wells, Sour Gas Wells and Slush Pits; and Development planned on filled ground. There may also be additional regional or local requirements.

Describe how compliance was met for any relevant nuisance, hazard or local requirement and provide any relevant documents such as reports, surveys, and letters.

HUD requirements for oil or gas wells are as follows: no residential structures may be located within 300 feet of the boundary of an operating or planned drilling site; no residential structures may be within 75 feet of an operating well, unless controls on nuisances, controls on noise caused by pumping, and spill controls to reduce the risk of contamination are taken; and no residential structures may be located within 10 feet of an abandoned well confirmed by the State government to have been safely and permanently abandoned, and if State government confirmation cannot be obtained, no residential structures may be located within 300 feet of the abandoned well. According to the Ohio Oil and Gas Wells accessed at https://gis.ohiodnr.gov/MapViewer/?config=oilgaswells no operating or planned drilling site or oil or gas wells are located within 300 feet of the subject property boundaries. Therefore, the project is in compliance with HUD’s oil and gas well requirements.

According to HUD guidelines, no structures, ancillary facilities or structures, common areas, parking areas or like property improvements or features may be constructed or located within 10 feet of or on the easement of a pressurized pipeline transferring flammable or combustible liquids or gases that exceed 200 psi operating pressure (pressurized pipelines). This does not apply to distribution lines supplying only the facility itself.

Based on field observations during D3G’s site inspection on September 23, 2025 as well as a review of the National Pipeline Mapping System (NPMS) Public Viewer accessed at https://pvnpms.phmsa.dot.gov/PublicViewer/, no pressurized pipelines were identified on or in the immediate vicinity of the subject property that would warrant an evaluation in accordance with HUD guidelines. Therefore, the project is in compliance with HUD’s pressurized pipeline requirements.

No additional nuisances or hazards were observed at the subject property or surrounding properties during the subject property inspection.

Ohio Oil & Gas Wells

September 24, 2025

1:2,257

0 0.01 0.03 0.05 mi

0 0.02 0.04 0.09 km

Statewide Parcels

Land Subdivision

Current Township

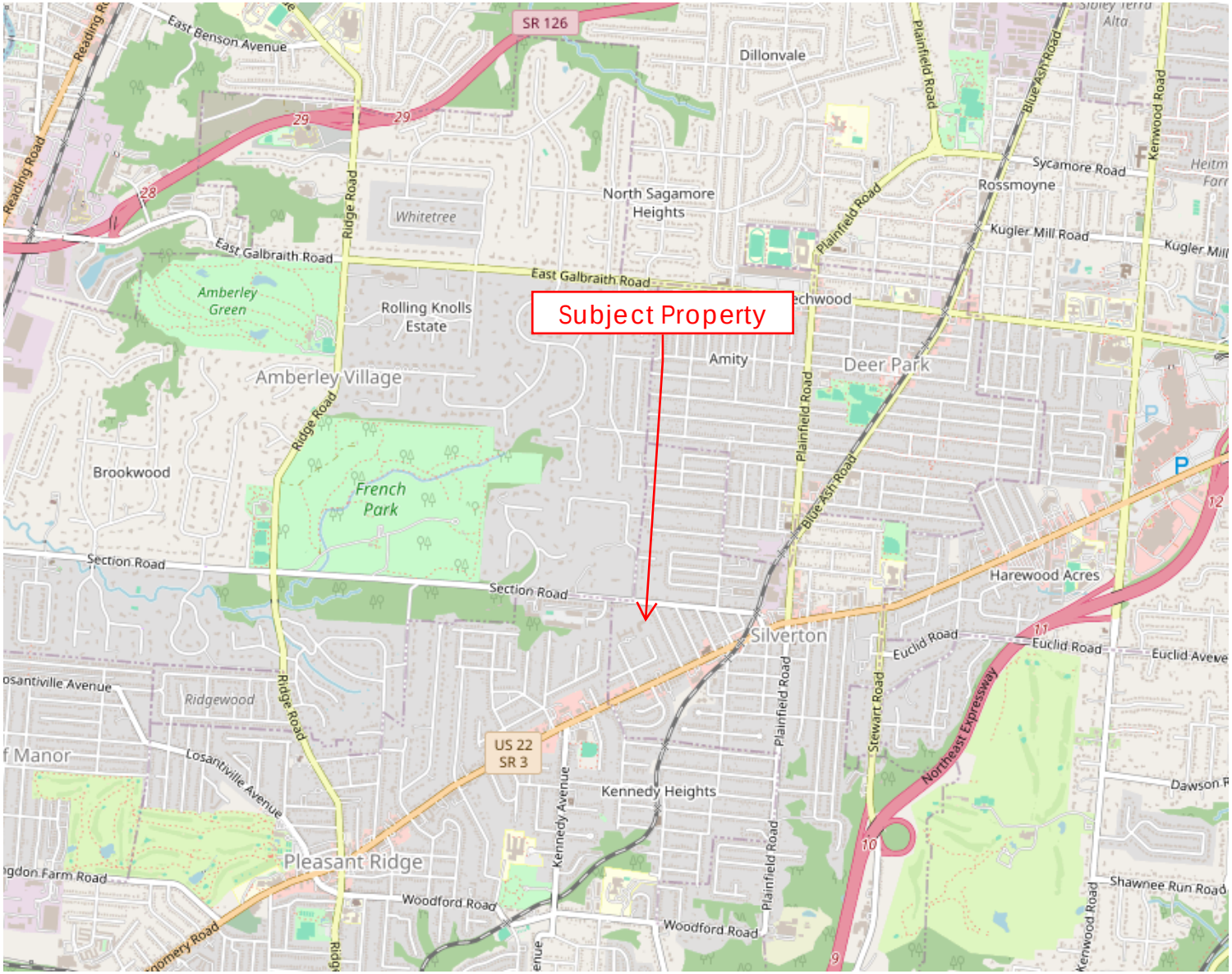
Counties

Maxar

ODNR - Division of Oil and Gas Resources Management

Pipeline and Hazardous Materials Safety Administration

NATIONAL PIPELINE MAPPING SYSTEM



Legend

- Accidents (Liquid)
- Incidents (Gas)
- LNG Plants
- Breakout Tanks
- Gas Transmission Pipelines
- Hazardous Liquid Pipelines
- Abandoned Pipelines

500 m
1000 ft

Pipelines depicted on this map represent gas transmission and hazardous liquid lines only. Gas gathering and gas distribution systems are not represented.

This map should never be used as a substitute for contacting a one-call center prior to excavation activities. Please call 811 before any digging occurs.

Questions regarding this map or its contents can be directed to npms@dot.gov.

Projection: Web Mercator

Datum: WGS84

Map produced by the Public Viewer application at www.npms.phmsa.dot.gov

Basemap image © OpenStreetMap contributors

Date Printed: Oct 02, 2025

811 Know what's below. Call before you dig.

SECTION 01 1000 - SUMMARY OF WORK

PART 1

1.01 Scope

A. The scope of work includes all labor, tools, equipment, materials and supervision to complete the work as follows:

B. Summary Project Description: See cover sheet of drawings for project summary.

PART 2

2.01 Job Requirements:

A. The requirements set forth in Division I shall apply to all Contractors and/or Subcontractors. Throughout the body of the specifications, the terms “General Contractor”, “Contractor”, “Plumbing Contractor”, “HVAC Contractor”, “Mechanical Contractor”, “Electrical Contractor”, “Subcontractor”, etc., are used and these terms shall indicate general and specific areas of responsibility. No “request for extra” will be entertained from any Contractor which arise out of interpretation of this language. The work will be bid and pursued under one (1) general construction contract. Products not specified but meeting the specification may be incorporated in the work provided they are approved in advance by the Architect. Refer to specification Section 01630 SUBSTITUTIONS AND PRODUCT OPTIONS.

B. Throughout the body of the specifications, from time to time, work required in one section and/or division of work is referred to from another section and/or division of work. Contractors are required to refer to all divisions of these specifications. The Contractor shall notify the Architect of the existence of any discrepancies found between the information contained in these plans and specification and actual field conditions. Notification shall be in writing seven (7) business days prior to the Initiation of Work. Failure to do so indicates acceptance by the Contractor of the information listed.

2.02 Special Requirements

A. The Contractor will submit a work schedule.

B. All work, except as noted otherwise, shall be performed between 7:00 a.m. to 5:00 p.m., Monday through Friday, excluding official state holidays. At each building and at the end of each day, remove all waste material, e.g., boxes, packing, debris, etc., and leave the area broom clean. Nails, sheet metal cut-offs and other sharp material shall be cleaned up regularly during the work. No such material shall remain at the end of the day

C. Workman shall park their vehicles where directed. No parking will be permitted on access roads and mobilization areas. Fire lanes shall be kept clear at all times to maintain access to the existing buildings on the site.

D. All Contractors shall be licensed as required by local and state agencies. Contractors shall verify these requirements with the respective governing agencies.

END OF SECTION

SECTION 01 1100 - ELECTRONIC MEDIA

PART 1 - GENERAL

1.01 DELIVERY OF ELETRONIC FILES

A. In accepting and utilizing any drawings, reports and data on any form of electronic media generated and furnished by the Berardi + Partners, Inc. (henceforth known as the Consultant), the recipient and user of data contained in the electronic media (henceforth known as the Client), agrees that all such electronic files are instruments of service of the Consultant, who shall be deemed the author, and shall retain all common law, statutory law and other rights, including copyrights.

B. The Client agrees not to reuse these electronic files, in whole or in part, for any purpose other than for the Project. The Client agrees not to transfer these electronic files to others without the prior written consent of the Consultant. The Client further agrees to waive all claims against the Consultant resulting in any way from any unauthorized changes to or reuse of the electronic files for any other project by anyone other than the Consultant.

C. The Client and the Consultant agree that any electronic files furnished by either party shall conform to the specifications listed in Exhibit. Any changes to the electronic specifications by either the Client or the Consultant are subject to review and acceptance by the other party. Additional services by the Consultant made necessary by changes to the electronic file specifications shall be compensated for as Additional Services.

D. Electronic files furnished by either party shall be subject to an acceptance period of thirty (30) days during which the receiving party agrees to perform appropriate acceptance tests. The party furnishing the electronic files shall correct any discrepancies or errors detected and reported within the acceptance period. After the acceptance period, the electronic files shall be deemed to be accepted and neither party shall have any obligation to correct errors or maintain electronic files.

E. The Client is aware that difference may exist between the electronic files delivered and the printed hard-copy construction documents. In the event of a conflict between the signed construction documents prepared by the Consultant and electronic files, the signed or sealed hard-copy construction documents shall govern.

F. In addition, the Client agrees, to the fullest extent permitted by law, to defend, indemnify and hold harmless the Consultant, its officers, directors, employees and sub consultants (collectively, Consultants) against all damages, liabilities or costs, including reasonable attorneys' fees and defense costs, arising from any changes made by anyone other than the Consultant or from any reuse of the electronic files without the prior written consent of the Consultant.

G. Under no circumstance shall delivery of electronic files for use by the Client be deemed a sale by the Consultant , and the Consultant makes no warranties, either express or implied, or merchantability and fitness for any particular purpose. In no event shall the Consultant be liable for indirect or consequential damages as a result of the Client's use or reuse of the electronic files.

CADD AND ELECTRONIC FILES

2.01 The Client acknowledges the Consultant's drawings and specification, including all documents on electronic media as instruments of the Consultant's professional service. Nevertheless, the drawings and specifications prepared under this Agreement shall become the property of the Client upon completion of the services and payment in full of all monies due to the Consultant. The Client shall not reuse or make or permit to be made any modification to the drawings and specifications without the prior written authorization of the Consultant. The Client agrees to waive any claim against the Consultant arising from any unauthorized transfer, reuse or modification of the drawings and specifications.

DISCLAIMER

3.01 Due to the nature of electronic media the Architect cannot warrant the accuracy of data contained herein. Any use or reuse of original or altered CADD design materials by the User or other parties without the review and written approval of the Architect shall be at the sole risk of the User. Furthermore, User agrees to defend, indemnify, and hold Architect harmless from all claims, injuries, damages, losses, expenses, and attorney's fees arising out of the modification or reuse of these materials.

END OF SECTION

SECTION 01 2300 - ALTERNATES

PART 1

1.01 General

A. State the amount that shall be added to or deducted from the Base Bid for each of the following alternates. Alternates may be accepted for 90 days after receipt of bids.

PART 2

2.01 Alternates

A. Provide alternate pricing for decorative aggregate (#4 round) ILO mulch.

B. Provide pricing to replace asphalt shingle roof.

C. Provide pricing to repace the two (2) balcony awnings:

1. Option 1: Replace fabric cover only. Replace in kind.
2. Option 2: Replace entire structure with new metal awning, cantilevered from new posts at the back of the balcony. Structure to be white, aluminum, with a solid canopy. Provide integrated gutters. Design inspiration images below:

D. Provide pricing to replace all doors shown as "existing to remain" (interior Common Area and Unit Entry doors). New doors to be 2-panel solid core routed or molded doors (Basis of Design: Jeld-Wen Carrara); 1hr fire rating; painted white. A 10" bottom rail is required per accessibility requirements.

E. Provide deduct pricing to keep existing ACT ceiling; replacing 10% of ACT tile to account for existing damage.

F. Provide deduct pricing to keep and paint existing wood base in corridors. At areas of new work only, provide new base to match existing.

G. Provide pricing for alternate mini-blinds (WT-3) in dwelling units. See schedule on I001.

PART 3

3.01 Voluntary Alternates:

A. Contractor is encouraged to submit voluntary alternates for procedures, materials or equipment that provide savings for the Owner. Each voluntary alternate is to be accompanied by necessary brochures, shop drawings, engineering, etc., for the Architect’s and Owner’s use in evaluating such alternates. The Owner may award contracts taking into account any and all voluntary alternates received. Any voluntary alternate submitted may be used to the benefit of the Owner even though the Bidder submitting the alternate may not be awarded the contract.

B. Each voluntary alternate is to be accompanied by necessary brochures, shop drawings, engineering, etc., for the Architect's and Owner's use in evaluating such alternates. The Owner may award contracts taking into account any and all voluntary alternates received. Any voluntary alternate submitted may be used to the benefit of the Owner even though the Bidder submitting the alternate may not be awarded the contract.

END OF SECTION

SECTION 01 2500 - SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

A. Section 01 2100 - Allowances, for cash allowances affecting this section.

B. Section 01 6000 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.

1.03 DEFINITIONS

A. Substitutions: See General Conditions for definition.

1.04 REFERENCE STANDARDS

A. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase); Current Edition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
2. Agrees to provide the same warranty for the substitution as for the specified product.
3. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.

1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.

D. Limit each request to a single proposed substitution item.

1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

A. Submittal Time Restrictions:

B. Submittal Form (before award of contract):

1. Submit substitution requests by completing CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage). See this form for additional information and instructions.
2. Other substition forms may be used pending approval from the Architect, but shall include at minimum the same information as the referenced CSI form.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. Submittal Form (after award of contract):

1. Submit substitution requests by completing CSI/CSC Form 13.1A - Substitution Request (After Bidding/Negotiating). See this form for additional information and instructions.
2. Other substition forms may be used pending approval from the Architect, but shall include at minimum the same information as the referenced CSI form.

B. Submit request for Substitution for Convenience within 14 days of discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
3. Bear the costs engendered by proposed substitution of:
   a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.

3.04 RESOLUTION

A. Architect will notify Contractor in writing of decision to accept or reject request.

1. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.05 ACCEPTANCE

A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.06 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

END OF SECTION

SECTION 01 2600 - CONTRACT CHANGE PROCEDURES

PART 1

1.01 General

A. Definitions:

1. Change Order: A written order to the Contractor, signed by the Owner, Architect and Contractor, which amends the Contract Documents as described and authorizes the Contractor to proceed with a change which affects the Contract Sum and/or Contract Time stated therein as a specific cost and/or time, respectively. This document may also be the result of a Change Bulletin or Construction Change Directive.
2. All Change Orders must be signed by all three parties to be legal and binding and shall not be drawn upon as a part of a pay request until fully executed.
3. Proposal Request: A written order initiated by the Project Architect which is a request for cost on the work described therein. A Proposal Request does not authorize the Contractor to proceed with the work involved. A Proposal Request, accepted by the Owner and Architect, shall become a Change Order. An itemized cost breakdown for the work described shall be submitted by the Contractor.
4. Architect's Supplemental Instructions: Written supplemental instructions or interpretations, signed by Architect making minor changes in the work not involving a change in Contract Sum or Contract Time which is to be signed and accepted by the Contractor.

PART 2

2.01 Documentation of Proposals

A. Support each quotation for a lump sum proposal, and for each unit price which has not previously been established, with sufficient substantiating data to allow Architect to evaluate the quotation.

B. Provide data to support time and cost computations:

1. Labor required.
2. Construction equipment required.
3. Products required:
   a. Recommended source of purchase and unit cost.
   b. Quantities required.
   c. Taxes, insurance and bonds.
   d. Profit per Section 007200, Supplemental General Conditions.
   e. Credit for work deleted from contract, similarly documented.
   f. Change in contract time, if any.
4. Document requests for substitutions for products as specified in Section 01630.

END OF SECTION 013200

SECTION 01 2700 - UNIT PRICES

PART 1

1.01 The following unit prices shall be included in each Contractor's bid and shall be used to add to or deduct from the Contractor's Base Bid. All prices shall be for complete cost of item fully installed. Refer to separate specification sections for detailed descriptions. Unit prices will not be used for additional work if, in the opinion of the Architect, the values seem out of line with current costs.

A. Unit Price 1
   1. Concrete for sidewalk repair (areas to be determined by Owner or Architect): $_____/sf.ft.

B. Unit Price 2:
   1. Landscape Materials:
      a. Seeding and mulching: $_____/sq.ft.
      b. Plantings (similar to existing):
         1) Tree (2"-3" caliper) $_____/each
         2) Shrub $_____/each
         3) Aggregate Planting Beds (washed river rock, #4) $_____/cu.ft.
         4) Compost in Planting Beds $_____/cu.ft.

C. Unit Price 3:
   1. Provide price to refinish one (1) existing bathtub and surround: $_____/each
      a. Refinishing of plumbing fixtures shall be accomplished by a subcontractor recognized as a professional in this type of refinishing and using products designed specifically for this application.

D. Unit Price 4:
   1. Provide price to repair damaged drywall at:
      a. Unit walls: $_____/sq.ft.
      b. Unit ceilings: $_____/sq.ft.

END OF SECTION

SECTION 01 3000 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.
B. Electronic document submittal service.
C. Preconstruction meeting.
D. Progress meetings.
E. Contractor's daily reports.
F. Coordination drawings.
G. Submittals for review, information, and project closeout.
H. Number of copies of submittals.
I. Requests for Interpretation (RFI) procedures.
J. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 3216 - Construction Progress Schedule: Form, content, and administration of schedules.
B. Section 01 7000 - Execution and Closeout Requirements: Additional coordination requirements.
C. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.
D. Section 01 8113 - Sustainability Design Requirements

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
B. Make the following types of submittals to Architect:
   1. Requests for Interpretation (RFI).
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Design data.
   6. Manufacturer's instructions and field reports.
   7. Applications for payment and change order requests.
   8. Progress schedules.
   9. Coordination drawings.
   10. Correction Punch List and Final Correction Punch List for Substantial Completion.
   11. Closeout submittals.

1.04 PROJECT COORDINATOR

A. Project Coordinator: Construction Manager.
B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for site access, traffic, and parking facilities.
C. During construction, coordinate use of site and facilities through the Project Coordinator.
D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 1000 - Summary.
F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
   1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
   2. Contractor and Architect are required to use this service.
   3. It is Contractor's responsibility to submit documents in allowable format.
   4. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no extra charge.
   5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
   7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.
B. Submittal Service: The selected service is:
C. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

D. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

A. Schedule meeting after Notice of Award.

B. Attendance Required:

1. Owner.
2. Architect.
3. Contractor.

C. Agenda:

1. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
2. Submission of initial Submittal schedule.
3. Designation of personnel representing the parties to Contract and Architect.
4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
5. Scheduling including work hours.
6. Scheduling activities of a Geotechnical Engineer.
7. Construction Schedule
8. Critical work sequencing
9. Designation of responsible personnel
10. Use of the premises.
11. Parking availability.
12. Office, work and storage areas.
13. Equpment deliveries and priorities.
14. Safety and security procedures.
15. First Aid

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

E. Independent Envelope Consultant to be provided by the Owner to review integrity of the building envelope and conduct ASTM water pressure testing during construction. Providing written reports. A minimum of (3) three visits will be required.

3.03 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.

B. Attendance Required:

1. Contractor.
2. Owner.
3. Architect.
4. Contractor's superintendent.
5. Major subcontractors.

C. Agenda:

1. Review minutes of previous meetings.
2. Review of work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of RFIs log and status of responses.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to work.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PREINSTALLATION CONFERENCES

A. Conduct a preinstallation conference at the Project Site before each construction activity that requires coordination with other construction.

B. Attendees: The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Architect of scheduled meeting dates.

C. Review the progress of other construction activities and preparations for the particular activity under consideration at each preinstallation conference.

D. Record significant discussions and agreements and disagreements of each conference, and the approved schedule. Promptly distribute the record of the meeting to everyone concerned, including the Owner and the Architect.

3.05 CONSTRUCTION PROGRESS SCHEDULE

A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

C. Within 10 days after joint review, submit complete schedule.
D. Submit updated schedule with each Application for Payment.

3.06 DAILY CONSTRUCTION REPORTS

A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.
B. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
    1. Date.
    2. High and low temperatures, and general weather conditions.
    3. List of subcontractors at Project site.
    4. List of separate contractors at Project site.
    5. Approximate count of personnel at Project site.
        a. Include a breakdown for supervisors, laborers, journeymen, equipment operators, and helpers.
    6. Major equipment at Project site.
    7. Material deliveries.
    8. Safety, environmental, or industrial relations incidents.
    9. Meetings and significant decisions.
    10. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
    11. Testing and/or inspections performed.
    12. Signature of Contractor's authorized representative.

3.07 COORDINATION DRAWINGS

A. Provide information required by Project Coordinator for preparation of coordination drawings.
B. Review drawings prior to submission to Architect.

3.08 REQUESTS FOR INFORMATION(RFI)

A. Definition: A request seeking one of the following:
    1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
    2. A resolution to an issue which has arisen due to field conditions and affects design intent.
B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
    1. Prepare a separate RFI for each specific item.
        a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
        b. Do not forward requests which solely require internal coordination between subcontractors.
    2. Prepare using software by Electronic Document Submittal Service.
    3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
C. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
    1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
    2. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
        a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.
D. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
    1. Official Project name and number, and any additional required identifiers established in Contract Documents.
    2. Owner's, Architect's, and Contractor's names.
    3. Discrete and consecutive RFI number, and descriptive subject/title.
    4. Issue date, and requested reply date.
    5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
    6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
    7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
E. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
F. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
    1. Indicate current status of every RFI. Update log promptly and on a regular basis.
    2. Note dates of when each request is made, and when a response is received.
    3. Highlight items requiring priority or expedited response.
    4. Highlight items for which a timely response has not been received to date.

G. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
   1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
H. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
   1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
   2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
   3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
   4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.09 SUBMITTAL SCHEDULE
A. Submit to Architect for review a schedule for submittals in tabular format.
   1. Submit at the same time as the preliminary schedule specified in Section - 01 3216 - Construction Progress Schedule.
   2. Coordinate with Contractor's construction schedule and schedule of values.
   3. Format schedule to allow tracking of status of submittals throughout duration of construction.
   4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
   5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.

3.10 SUBMITTALS FOR REVIEW
A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.
B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
C. Samples will be reviewed for aesthetic, color, or finish selection.
D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.11 SUBMITTALS FOR INFORMATION
A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.
B. Submit for Architect's knowledge as contract administrator or for Owner.

3.12 SUBMITTALS FOR PROJECT CLOSEOUT
A. Submit Correction Punch List for Substantial Completion.
B. Submit Final Correction Punch List for Substantial Completion.
C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.
D. Final As Built Property Survey.
E. Submit for Owner's benefit during and after project completion.

3.13 NUMBER OF COPIES OF SUBMITTALS
A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
B. Documents for Review:
   1. Small Size Sheets, Not Larger Than 8-1/2 by 11 inches: Submit the number of copies that Contractor requires, plus two copies that will be retained by Architect.
   2. Larger Sheets, Not Larger Than 36 by 48 inches: Submit one reproducible transparency and one opaque reproduction.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.14 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a separate transmittal for each item.
   2. Transmit using approved form.
      a. Use Contractor's form, subject to prior approval by Architect.
   3. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   4. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   5. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
      a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
   6. Submittals using reproduced Architect or Engineer's drawings will not be accepted.
   7. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Upload submittals in electronic form to Electronic Document Submittal Service website.
   8. Schedule submittals to expedite the Project, and coordinate submission of related items.
      a. For each submittal for review, allow 10 business days excluding delivery time to and from the Contractor.
      b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
   9. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
   10. Provide space for Contractor and Architect review stamps.
   11. When revised for resubmission, identify all changes made since previous submission.
   12. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
   13. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
   14. Submittals not requested will not be recognized or processed.

B. Product Data Procedures:
   1. Submit only information required by individual specification sections.
   2. Collect required information into a single submittal.
   3. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
   2. Do not reproduce Contract Documents to create shop drawings.
   3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
   1. Transmit related items together as single package.
   2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
   3. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated omponents, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.
   4. Submit Samples for review of size, kind, color, pattern, and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
      a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least 3 sets that show approximate limits of the variations.
      b. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.

E. Transmit each submittal with approved form.

3.15 SUBMITTAL REVIEW

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.
B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.
C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
   1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.

D. Architect's and consultants' actions on items submitted for review:
   1. Authorizing purchasing, fabrication, delivery, and installation:
      a. Reviewed or Furnish as Corrected.
   2. Not Authorizing fabrication, delivery, and installation:
      a. "Revise and Resubmit".
         1) Resubmit revised item, with review notations acknowledged and incorporated.
      b. "Rejected".

1) Submit item complying with requirements of Contract Documents.

E. Architect's and consultants' actions on items submitted for information:

1. Items for which no action was taken:

a. "Received" - to notify the Contractor that the submittal has been received for record only.

END OF SECTION

SECTION 01 3100 - PROJECT COORDINATION

SCOPE

1.01 Related Requirements:

A. Conditions of the Contract.
   1. Section 011000 SUMMARY OF WORK.
   2. Section 014010 TESTING LABORATORY SERVICES.
   3. Section 00 7200 GENERAL CONDITIONS
      a. AIA Document A201 (2007) General Conditions to the Contract for Construction
   4. Section 00 8000 SUPPLEMENTARY CONDITIONS

B. Utility Shut-Offs and Changeovers:
   1. Notify the Architect and Owner at least 72 hours in advance of utility connections or shutoff. Coordinate these operations with the Owner, through the Architect, and complete the work in the minimum amount of time.
   2. Utility services and building services shut-offs result in extremely critical curtailment of building services and operation. Shut-offs must be accomplished at the Owner's schedule, and overtime, round the clock, holiday or weekend work may be required at no additional cost to the Owner; or at the Contractors' option, by-pass service may be provided.

C. Progress of the Work: Keep Architect informed of the progress of the work.

D. Deliveries: If requested, provide verification of delivery dates required to conform to the then current project construction schedule.

E. Chases: Unless otherwise specified or indicated, all items such as piping, ductwork and conduit shall be concealed in walls or chases. Cutting or chasing required after walls are in place shall be performed by the proper trades or crafts at the expense of the trade or craft requiring the cutting or chasing.

F. Tests: Where the contract documents require any work to be tested, the Architect shall be notified sufficiently in advance so that he may observe such tests.

G. Each Sub-Contractor shall be responsible for coordination of their work with the entire scope of the project defined by the Construction Drawings and Specifications.

END OF SECTION 013410

SECTION 01 3216 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.02 REFERENCE STANDARDS

A. AGC (CPSM) - Construction Planning and Scheduling Manual; 2004.

B. M-H (CPM) - CPM in Construction Management - Project Management with CPM; 2015.

1.03 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 10 days after joint review, submit complete schedule.

D. Submit updated schedule with each Application for Payment.

1.04 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

1.05 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Diagram Sheet Size: Maximum 22 x 17 inches.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

C. Identify work of separate stages and other logically grouped activities.

D. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

E. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.

F. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Architect at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

1. Retain columns in the schedule to track original contract start and finish dates of all activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

3.06 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION

SECTION 01 3300 - SUBMITTAL PROCEDURES

SCOPE

1.01 Submittal Procedure

A. Contractors and Subcontractors that are required to submit information shall submit to the Architect the following:
   1. Shop Drawings: Minimum six (6) sets of drawings. Four (4) will be returned.
   2. Number of Copies: Architect and any associated outside consultant will retain one print each; remainder will be returned. Consequently, GC shall submit as many copies needed to meet foregoing requirement and their own distribution needs.
   3. the Contractors and Subcontractors submitting drawings and/or product information shall allow ten (10) working days processing time for the Architect to review and return such submittals. The Architect will not be held responsible for delays in construction resulting from the Contractor and Subcontractor being required to resubmit drawings and/or product information. Contractors and subcontractors shall correct and return to Architect submittals marked either “Note Markings”, “Resubmit”, “Rejected”, or “Not Reviewed” within ten (10) calendar days.
   4. The General Contractor shall review all shop drawings and other submittals received from all sub-contrcatrors and material men for conformance with drawings and specifications. If the General Contractor cannot verify required conformance with the Contract Documents, shop drawings and all other submittals shall be resubmitted by the General Contractor to the subcontractors and material suppliers for correction prior to the General Contractor's submittal to the Architect. Shop drawings or other submittals transmitted by the General Contractor to the Architect and/or to the Owner attest that a complete review for accuracy and application for the project has been completed to very conformance with the Contract Documents.
   5. Shop Drawings Contractors and Subcontractors submitting drawings and/or product information shall allow ten (10) working days processing time for the Architect to review and return such submittals. The Architect will not be held responsible for delays in construction resulting from the Contractor and Subcontractor being required to resubmit drawings and/or product information. Contractors and subcontractors shall correct and return to Architect submittals marked either “Note Markings”, “Resubmit”, “Rejected”, or “Not Reviewed” within ten (10) calendar days.

1.02 SHOP DRAWINGS

A. Submittals shall be made through the General Contractor. Submittals not received from the General Contractor shall be returned without review.
B. Shop drawings not requested by the Architect shall be returned without action
C. The Contractor shall not perform any portion of the Work requiring submittal and review of shop drawings, product data, samples or similar submittals until the respective submittal has been approved by the Architect. Such Work shall be in accordance with approved submittals.
D. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the bases of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
   1. AutoCAD Drawings: A CD copy of CAD Drawings may be available from the Architect. The Contractor requiring this service must contact the Architect to verify availability. Cost to obtain AutoCAD drawings will be $150.00 per Drawing Sheet. Request for CD copy should be addressed to the Project Architect.
E. Shop Drawings shall include the following information:
   1. Dimensions.
   2. Identification of products and materials included by sheet and detail number or by schedule identification number.
   3. Compliance with specified standards.
   4. Notation of coordination requirements.
   5. Notation of dimensions established by field measurements.
F. By approving and submitting shop drawings, the Contractor thereby represents that he has determined and verified field measurements, field construction criteria, materials, catalog numbers, and similar data, and that he has checked and coordinated each shop drawing with the requirements of the Work and of the Contract Documents prior to submitting to the Architect.
G. The Contractor shall make corrections required by the Architect and shall resubmit the required number of corrected copies of shop drawings until appropriately marked. The Contractor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections requested by the Architect on previous submissions.
H. The Architect will review shop drawings only for conformance with the design concept of the Project and with the information given in the Contract Documents. The Architect’s review of a separate item shall not indicate review of an assembly in which the item functions.
   1. Only shop drawings, product data, and samples marked “No Exceptions Taken” or “Note Markings/Confirm” shall be considered “final” and used in conjunction with the work of this Project.
I. The Architect’s review of shop drawings shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has informed the Architect in writing of such deviation at the time of submission and the Architect has given written approval to the specific deviation, nor shall the Architect’s action relieve the Contractor from responsibility for errors or omissions in the shop drawings.
   1. The Architect’s review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and qualities, or for substantiating instructions or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. Unless otherwise specifically stated by the Architect, the Architect’s review shall not

constitute approval of safety precautions or, of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which it is a component.

J. Notations and remarks added to shop drawings by the Architect are to insure compliance to Drawings and Specifications and do not imply a requested or approved change to contract cost.

K. Should deviations, discrepancies, or conflicts between shop and contract drawings and Specifications be discovered, either prior to or after review, Contract Documents shall control and be followed.

L. Shop drawings will be marked as follows: Contractor shall take the following action for each respective marking:

1. "NO EXCEPTIONS TAKEN" - Copies will be distributed as indicated under above schedule.
2. "NOTE MARKINGS/CONFIRM" - Final but Restricted Release; Contractor may proceed with fabrication, taking into account the necessary corrections on submittal and with Contract Documents.
3. "NOTE MARKINGS/RESUBMIT" - Contractor may proceed with fabrication, taking into account the necessary corrections. Corrected shop drawings shall be resubmitted before fabrication of this work is complete to obtain a different action marking. Do not allow drawings marked "Resubmit" to be used in connection with installation of the Work.
4. "REJECTED" - Contractor will be required to resubmit shop drawings in their entirety. No fabrication or installation shall be started until shop drawings so marked have been completely revised, resubmitted, and marked by Architect according to preceding Paragraphs a or b.

1.03 Product Data

A. Collect Product Data into a single submittal for each element of construction or system. Product data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, rough-in diagrams and templates, standard wiring diagrams, and performance curves.

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:
   a. Manufacturer's printed recommendations.
   b. Compliance with trade association standards.
   c. Compliance with recognized testing agency standards.
   d. Application of testing agency labels and seals.
   e. Notation of dimensions verified by field measurement.
   f. Notation of coordination requirements.
   g. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
      1) Preliminary Submittal: Submit a preliminary single copy of Product Data where selection of options is required.
   h. Submittals: Submit copies in accordance with Section C, item 11 above. The Architect will retain two and will return the others marked with action taken and corrections or modifications required.
      1) Unless non-compliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
   i. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
      1) Do not proceed with installation until a copy of Product Data is in the installer's possession.
      2) Do not permit use of unmarked copies of Product Data in connection with construction.

B. In compliance with the OSHA Hazard Communication Standard (1910.1200, 08-24-1987), Contractors shall post at the site MSDS (Material Safety Data Sheets) for ALL products classified as hazardous that their firm has knowledge that they will be furnishing, using, or storing on the job site during the duration of this Project in accordance with OSHA standards. At the completion of the project, the Contractor shall turn their "MSDS" information directly over to the Owner with a receipt for the Owner to sign. A copy of the signed receipt only shall be submitted to the Architect.

1. Material Safety Data Sheets (MSDS) shall not be submitted to the Architect for review. Material Safety Data Sheets submitted to Architect will be returned with no action taken.

1.04 Samples

A. The Contractor shall submit to the Architect triplicate samples to illustrate materials or workmanship, colors, and textures, and establish standards by which the Work will be judged.

1. Submit full size, fully fabricated samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern. Where variation in color, pattern, texture, and other characteristic is inherent in the material or product represented, submit at least 3 multiple units that show approximate limits of the variations.

B. By approving and submitting samples, the Contractor thereby represents that he has determined and verified materials, catalog numbers, and similar data, and that he has checked and coordinated each sample with the requirements of the Work and of the Contract Documents prior to submitting to the Architect.

C. The Architect will review samples but only for conformance with the design concept of the Project and with the information given in the Contract Documents. The Architect's review of a separate item shall not indicate approval of an assembly in which the item functions.

D. The Architect's action shall not relieve the Contractor of responsibility for deviations from the requirements of the Contract Documents unless the Contractor has informed the Architect in writing of the deviation at the time of

submission and the Architect has given written approval to the specific deviation, nor shall the Architect's action relieve the Contractor from responsibility for errors or omissions in the samples.

E. Materials shall not be ordered until final review is received in writing from the Architect. Materials shall be furnished, equal in every respect to reviewed samples. Where color or shade cannot be guaranteed, the maximum deviation shall be indicated by the manufacturer. Work shall be in accordance with the final reviewed samples.

1.05 Quality Requirements

A. Delegated Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to the Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

B. Mock-ups of certain exterior and interior finish products and assemblies will be required. Items to be mocked up will include brock and stone or other masonry veneers, windows, siding, trim, and color samples. Interior finishes may include assemblies of millwork, colors, flooring materials, etc. Refer to Section 01 4000 Quality Requirements.

END OF SECTION 013300

SECTION 01 3553 - SECURITY PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Security measures including formal security program, entry control, and miscellaneous restrictions.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: use of premises and occupancy.

B. Section 01 5000 - Temporary Facilities and Controls: Temporary lighting.

1.03 SECURITY PROGRAM

A. Protect Work , existing premises and Owner's operations from theft, vandalism, and unauthorized entry.

B. Initiate program at project mobilization.

C. Maintain program throughout construction period until Owner occupancy.

1.04 ENTRY CONTROL

A. Restrict entrance of persons and vehicles into Project site and existing facilities.

B. Allow entrance only to authorized persons with proper identification.

C. Maintain log of workers and visitors, make available to Owner on request.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 4000 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.
B. Quality assurance.
C. References and standards.
D. Testing and inspection agencies and services.
E. Control of installation.
F. Tolerances.
G. Manufacturers' field services.
H. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Document 00 3100 - Available Project Information: Soil investigation data.
B. Document 00 7200 - General Conditions: Inspections and approvals required by public authorities.
C. Section 01 2100 - Allowances: Allowance for payment of testing services.
D. Section 01 4216 - Definitions.

1.03 REFERENCE STANDARDS

A. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2014.
B. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2013.
C. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2021.
D. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2020.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Testing Agency Qualifications:
   1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Labratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Qualification Statement: Provide documentation showing testing labratory is accredited under IAS AC89.
C. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
D. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Results of test/inspection.
      j. Compliance with Contract Documents.
      k. When requested by Architect, provide interpretation of results.
   2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
E. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
   2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
F. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
G. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
   1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.05 Quality Assurance

A. Testing Agency Qualifications:
   1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

1.06 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
C. Obtain copies of standards where required by product specification sections.
D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.07 Testing and Inspection Agencies and Services

A. Owner will employ services of an independent testing agency to perform certain specified testing; payment for cost of services will be derived from allowance specified in Section 01 2100; see Section 01 2100 and applicable sections for description of services included in allowance.
B. Contractor will assist Owner with procuring the services of an independent testing agency.
C. Owner will employ and pay for services of an independent testing agency to perform other specified testing.
D. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
B. Comply with manufacturers' instructions, including each step in sequence.
C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
E. Have work performed by persons qualified to produce required and specified quality.
F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
C. Adjust products to appropriate dimensions; position before securing products in place.

3.03 TESTING AND INSPECTION

A. See individual specification sections for testing required.
B. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.
C. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.
D. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.04 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment, and _____ as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.05 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 4216 - DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

A. Other definitions are included in individual specification sections.

1.02 DEFINITIONS

A. Furnish: To supply, deliver, unload, and inspect for damage.

B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.

C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.

D. Provide: To furnish and install.

E. Supply: Same as Furnish.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 4219 - REFERENCE STANDARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

1.02 RELATED REQUIREMENTS

A. Document 00 7200 - General Conditions: Reference standards.

1.03 QUALITY ASSURANCE

A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.

C. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect shall be altered by Contract Documents by mention or inference otherwise in any reference document.

PART 2 CONSTRUCTION INDUSTRY ORGANIZATION DOCUMENTS

2.01 AA -- ALUMINUM ASSOCIATION, INC.

A. AA DAF-45 - Designation System for Aluminum Finishes; 2003.

2.02 AABC -- ASSOCIATED AIR BALANCE COUNCIL

A. AABC MN-1 - AABC National Standards for Total System Balance; 2002.

2.03 AAMA -- AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2011.

B. AAMA 501.1 - Standard Test Method for Exterior Windows, Curtain Walls and Doors for Water Penetration Using Dynamic Pressure; 2005.

C. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; 2009.

D. AAMA 603.8 - Voluntary Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum; 1998.

E. AAMA 605.2 - Voluntary Specification for High Performance Organic Coatings on Architectural Aluminum Extrusions and Panels; 1998.

F. AAMA 606.1 - Voluntary Guide Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum; 1976.

G. AAMA 607.1 - Voluntary Guide Specification and Inspection Methods for Clear Anodic Finishes For Architectural Aluminum; 1977.

2.04 ASTM B Series -- ASTM INTERNATIONAL

A. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2012.

B. ASTM B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold-Finished Bar, Rod, and Wire (Metric); 2012.

2.05 ASTM E Series -- ASTM INTERNATIONAL

A. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).

2.06 AWPA -- AMERICAN WOOD-PRESERVERS' ASSOCIATION

2.07 ICC -- INTERNATIONAL CODE COUNCIL, INC.

2.08 NEMA -- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

A. NEMA FU 1 - Low Voltage Cartridge Fuses; 2012.

2.09 NFPA -- NATIONAL FIRE PROTECTION ASSOCIATION

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

2.10 NFRC -- NATIONAL FENESTRATION RATING COUNCIL, INC.

A. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2014.

2.11 NSF -- NSF INTERNATIONAL (THE PUBLIC HEALTH AND SAFETY ORGANIZATION)

2.12 UL -- UNDERWRITERS LABORATORIES INC.

A. UL (FRD) - Fire Resistance Directory; Current Edition.

END OF SECTION

SECTION 01 4533 - CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

PART 1 GENERAL

1.01 Section Includes

A. Code-required special inspections.
B. Testing services incidental to special inspections.
C. Submittals.
D. Manufacturers' field services.
E. Fabricators' field services.

1.02 Definitions

A. Code or Building Code: ICC (IBC), International Building Code, most recent edition adopted by authority having jurisdiction, including all applicable amendments and supplements without limitation, and specifically Chapter 17 - Special Inspections and Tests.
B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.
C. NIST: National Institute of Standards and Technology.
D. International Accreditation Service, Inc. (IAS).
E. National Institute of Standards and Technology (NIST).
F. Special Inspections and Tests: Inspections and testing of materials, installation, fabrication, erection, or placement of components and connections mandated by Building Code to safeguard public welfare.
    1. Special inspections and tests are separate from and independent of tests and inspections conducted by Owner or Contractor for purposes of quality assurance and contract administration.

1.03 Reference Standards

A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata.
B. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2020.
C. IAS AC291 - Accreditation Criteria for Special Inspection Agencies AC291; 2019.
D. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 Submittals

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Special Inspection Agency Qualifications: Prior to start of work, Special Inspection Agency is required to:
    1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
    2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
    3. Submit certification that Special Inspection Agency is acceptable to AHJ.
    4. Submit documentation that Special Inspection Agency is accredited by IAS according to IAS AC291.
C. Testing Agency Qualifications: Prior to start of work, Testing Agency is required to:
    1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
    2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
    3. Submit certification that Testing Agency is acceptable to AHJ.
    4. Submit documentation that Testing Agency is accredited by IAS according to IAS AC89.
D. Special Inspection Reports: After each special inspection, Special Inspector is required to submit at least two copies of report; one to Architect and one to AHJ.
    1. Include:
        a. Date issued.
        b. Project title and number.
        c. Name of Special Inspector.
        d. Date and time of special inspection.
        e. Identification of product and specifications section.
        f. Location in the Project.
        g. Type of special inspection.
        h. Date of special inspection.
        i. Results of special inspection.
        j. Compliance with contract documents.
    2. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.
E. Fabricator Special Inspection Reports: After each special inspection of fabricated items at fabricator's facility, Special Inspector is required to submit report to Architect and to AHJ.
    1. Include:
        a. Date issued.
        b. Project title and number.
        c. Name of Special Inspector.
        d. Date and time of special inspection.
        e. Identification of fabricated item and specification section.

f. Location in the Project.
g. Results of special inspection.
h. Verification of fabrication and quality control procedures.
i. Compliance with contract documents.
j. Compliance with referenced standards.

F. Test Reports: After each test or inspection, Testing Agency is required to submit report to Architect and to AHJ.
1. Include:
a. Date issued.
b. Project title and number.
c. Name of inspector.
d. Date and time of sampling or inspection.
e. Identification of product and specifications section.
f. Location in the Project.
g. Type of test or inspection.
h. Date of test or inspection.
i. Results of test or inspection.
j. Compliance with contract documents.

G. Certificates: When required by AHJ, Special Inspector will submit certification by manufacturer, fabricator, and installation subcontractor to Architect and AHJ.
1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect and AHJ.

H. Fabricator's Inspection Reports: When required by AHJ, submit reports to Architect and AHJ.

1.05 Special Inspection and Testing Agency
A. Owner will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling required by the building code .
B. The Contractor will coordinate with the Owner's Special Inspection Agency all required inspections and shall be responsible to arrange, schedule and notify the Special Inspection Agency accordingly.
C. The Special Inspection Agency may employ and pay for services of an independent testing agency to perform testing and sampling associated with special inspections and required by the building code.
D. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of contract documents.

1.06 Testing and Inspection Agencies
A. Owner may employ services of an independent testing agency to perform additional testing and sampling associated with special inspections but not required by the building code .
B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of contract documents.

1.07 Quality Assurance
A. Special Inspection Agency Qualifications:
1. Independent firm specializing in performing testing and inspections of the type specified in this section.
2. Accredited by IAS according to IAS AC291.
B. Testing Agency Qualifications:
1. Independent firm specializing in performing testing and inspections of the type specified in this section.
2. Accredited by IAS according to IAS AC89.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 Special Inspections and Testing
A. The Code requires special inspections and testing of certain materials, components, assemblies, and connections used in constructing the project. Special inspections and testing will be performed in accordance with the Code.
B. Special inspections and testing will be performed in accordance with the Code for the following materials and project components:
1. Concrete.
2. Masonry.
3. Wood.
4. Soils.
5. Sprayed fire-resistant materials.
6. Mastic and intumescent fire-resistant coatings.
7. Fire-resistant penetrations and joints.
8. Wind resistance.
9. Structural observations required by ICC (IBC) section 1704.6.
10. Special cases as determined by building official and required by ICC (IBC) section 1705.1.

3.02 Special Inspections for Sprayed Fire Resistant Materials
A. Sprayed Fire Resistant Materials, General:
1. Verify compliance of sprayed-fire resistant materials with specific fire-rated assemblies indicated in approved Contract Documents, and with applicable requirements of the building code.
2. Perform special inspections after rough installation of electrical, mechanical, plumbing, automatic fire sprinkler and suspension systems for ceilings.

B. Physical and visual tests: Verify compliance with fire resistance rating.
   1. Condition of substrates; periodic.
   2. Thickness of sprayed fire resistant material; periodic.
   3. Density of sprayed fire resistant material in pounds per cubic foot; periodic.
   4. Bond strength (adhesion and cohesion); periodic.
   5. Bond strength (cohesion); periodic.
   6. Condition of finished application; periodic.
C. Structural member surface conditions:
   1. Inspect structural member surfaces before application of sprayed fire resistant materials; periodic.
   2. Verify preparation of structural member surfaces complies with approved Contract Documents and manufacturer's written instructions; periodic.
D. Application:
   1. Ensure minimum ambient temperature before and after application complies with the manufacturer's written instructions; periodic.
   2. Verify area where sprayed fire resistant material is applied is ventilated as required by the manufacturer's written instructions during and after application; periodic.
E. Thickness: Verify that no more than 10 percent of thickness measurements taken from sprayed fire resistant material are less than thickness required by fire resistance design in approved Contract Documents. In no case shall the thickness of the sprayed fire resistant material be less than the minimum below.
   1. Minimum Allowable Thickness: Tested according to ASTM E605/E605M, periodic.
      a. Design thickness 1 inch or greater: Design thickness minus 1/4 inch.
      b. Design thickness greater than 1 inch: Design thickness minus 25 percent.
F. Density: Verify density of sprayed fire resistant material is no less than density required by the fire resistance design in the approved Contract Documents.
G. Bond Strength: Verify adhesive and cohesive bond strength of sprayed fire resistant materials is no less than 150 pounds per square foot when in-place samples of the cured material are tested according to ASTM E736/E736M and as described below.

3.03 Special Inspection Agency Duties and Responsibilities
A. Special Inspection Agency shall:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified reference standards.
   3. Ascertain compliance of materials and products with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests or inspections specified.
B. Limits on Special Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the work.
C. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
D. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.04 Testing Agency Duties and Responsibilities
A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests or inspections specified.
B. Limits on Testing or Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the work.
C. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.
D. Contractor will pay for re-testing required because of non-compliance with specified requirements.

3.05 Contractor Duties and Responsibilities
A. Contractor Responsibilities, General:
   1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
   2. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to work to be tested or inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested or inspected.

c. To facilitate tests or inspections.
d. To provide storage and curing of test samples.

4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

B. Contractor Responsibilities, Seismic Force-Resisting System, Designated Seismic System, and Seismic Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and Owner prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.

C. Contractor Responsibilities, Wind Force-Resisting System and Wind Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and Owner prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.

END OF SECTION

SECTION 01 5000 - TEMPORARY FACILITIES

PART 1

1.01 Sanitation, Light, Power, Heat & Water

A. (Insert description of needs for Temporary Electricity, Heat, & Water)

B. It will be the Contractor's responsibility to provide such temporary toilet facilities as required and to introduce and enforce among his employees such regulations in regard to cleanliness and the disposal of garbage and waste as shall be required to maintain a neat and clean building and shall comply with all local ordinances. The Contractor shall take such means as the Architect may direct to effectually prevent the creation of a nuisance on the work or on any part of the property of the Owner.

1.02 Office, Storage and Facilities for Architect's Representative

A. The Contractor shall take charge of the work during construction and shall provide an office "area" outside of the existing building, at an approved location. This area shall have copies of all correspondence, construction drawings and specifications including all changes and revisions and shop drawings. Contractor's office shall be large enough to host on-site meetings with Owner and Architect.

B. The Contractor shall provide any such waterproofed and secure storage sheds or trailers as required to protect his materials and the Owners materials. Remove all temporary structures upon completion of the work.

C. Storage sheds and trailers on site may be installed or used only with prior approval of the Owner. Locate as directed.

1.03 Telephone Service

A. The Contractor shall provide either a portable telephone (cellular phone) or a telephone at a fixed location on the job during the operations for his own use in the work and the use of all subcontractors engaged in the work. Toll charges will be paid by the persons making the long distance calls. The superintendent shall carry either a cordless phone or a pager so that he may be contacted any time during working hours.

1.04 Disposal Facilities

A. The Contractor shall provide dumpsters at the project for the duration of the project, locate in areas as approved by the Owner. Use of the Owner's dumpsters (if applicable) is prohibited. The Contractor may choose to remove all refuse on a daily basis in lieu of providing a dumpster.

1.05 Barricades and Warnings

A. The General Contractor shall construct and maintain all barricades as required to provide protection to the public and to the work. Danger signals, warning signs, red flags, lanterns and lights shall be provided and maintained as needed. All the above shall comply with all applicable codes and ordinances and shall be as approved by the Owner and the Architect.

END OF SECTION 015000

SECTION 01 5480 - UTILITY PROTECTION

SCOPE

1.01 Related Requirements:

A. Conditions of the Contract.

1. Section 011000 SUMMARY OF WORK.
2. Division 2 - Sitework: Utilities.
3. Division 15 - Mechanical.
4. Division 16 - Electrical.

B. Job Requirements:

1. Existing utility lines and structures indicated or known, and utility lines constructed for this project shall be protected from damage during construction operations. It is the Contractor's responsibility to contact the appropriate underground utility location agency to ensure that all recorded underground utility lines are properly marked. Repair to damaged utilities resulting from Contractor failing to take the proper precaution will be paid for at the Contractor's expense.
2. Locate and flag all lines and structures before beginning excavation and other construction operations.

1.02 Removal and Relocation

A. When utility lines and structures that are to be removed or relocated are encountered within the area of operations, notify the Architect and affected utility in ample time for the necessary measures to be taken to prevent interruption of the services.

1.03 Unknown Locations

A. Damage to existing utility lines or structures not indicated or known shall be reported immediately to the Architect and the affected utility. If determined that repairs are required under the Contract, the Contract Amount will be adjusted in accordance with the Conditions to the Contract

END OF SECTION

SECTION 01 5690 - CLEANING

GENERAL

1.01 Related Requirements: As specified Elsewhere:

A. Supplementary General Conditions: Section 00800
   1. Summary of Work: Section 011000
   2. Cleaning for Specific Products or Work
   3. Specification Section for that Work

B. All cleaning shall be the responsibility of the Contractor unless specifically noted otherwise.

C. Contractor shall police and clean-up on a continuing basis, during his presence in the project, in all areas in which he is performing work; maintain premises and public properties free from accumulation of waste, debris, and rubbish.

D. At the completion of the Work, Contractor shall remove waste materials, rubbish, tools, equipment, machinery, and surplus materials and clean all sight-exposed surfaces. Leave project clean and ready for final cleaning.

1.02 Requirements of Regulatory Agencies

A. Maintain project in accordance with Occupational Safety and Health Act, latest edition, as it applies to clean-up.

B. Conduct cleaning and disposal operations in compliance with local ordinances and anti-pollution laws.
   1. Do not burn or bury rubbish and waste materials on site.
   2. Do not dispose or volatile waste, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.

1.03 Products

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned, and use cleaning materials only on surfaces recommended by cleaning material manufacturer.

1.04 Execution

A. During Construction: Execute cleaning to ensure that the building, grounds, and public properties are maintained free from accumulation of waste and rubbish.
   1. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
   2. At reasonable intervals during progress of work, clean site and public properties, and dispose of waste materials, debris, and rubbish.
   3. Provide on-site containers for collection of waste materials, debris, and rubbish.
   4. Remove waste materials, debris, and rubbish from site and legally dispose of at a public or private dumping area off Owner's property.
   5. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
   6. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

B. Final Cleaning: The Contractor shall be responsible for final cleaning.
   1. Employ experienced workmen, or professional cleaners for final cleaning.
   2. In preparation for substantial completion or occupancy, conduct final inspection of sight exposed interior and exterior surfaces and of concealed spaces.
   3. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed surfaces; polish surfaces so designated to shine finish.
   4. Repair, patch and touch-up marred surfaces to specified finish, to match adjacent surfaces.
   5. Remove all foreign materials from site areas.
   6. Broom clean paved surfaces; rake clean other surfaces of grounds.
   7. Remove snow and ice from access to building if applicable.
   8. Contractor shall be responsible for cleaning all equipment installed.
   9. Maintain cleaning until project or portion thereof is occupied by Owner.

END OF SECTION 015690

SECTION 01 5713 - TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prevention of erosion due to construction activities.
B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
C. Restoration of areas eroded due to insufficient preventive measures.
D. Performance bond.
E. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02 RELATED REQUIREMENTS

A. Section 31 1000 - Site Clearing: Limits on clearing; disposition of vegetative clearing debris.
B. Section 31 2200 - Grading: Temporary and permanent grade changes for erosion control.
C. Section 32 1500 - Aggregate Surfacing: Temporary and permanent roadways.

1.03 REFERENCE STANDARDS

A. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus; 2021.
B. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 1999a (Reapproved 2014).
C. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2015 (Reapproved 2023).
D. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a.
E. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2021a.
F. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).
G. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; Current Edition.
H. FHWA FLP-94-005 - Best Management Practices for Erosion and Sediment Control; 1995.
I. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service; 2015.

1.04 PERFORMANCE REQUIREMENTS

A. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP), whether the project is required by law to comply or not.
B. Best Management Practices Standard: FHWA FLP-94-005.
C. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
D. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
E. Provide to Owner a Performance Bond covering erosion and sedimentation preventive measures only, in an amount equal to 100 percent of the cost of erosion and sedimentation control work.
F. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
G. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
    1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
    2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.
H. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
    1. Control movement of sediment and soil from temporary stockpiles of soil.
    2. Prevent development of ruts due to equipment and vehicular traffic.
    3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
I. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
    1. Prevent windblown soil from leaving the project site.
    2. Prevent tracking of mud onto public roads outside site.
    3. Prevent mud and sediment from flowing onto sidewalks and pavements.
    4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
J. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
    1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
    2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.
K. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
    1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
L. Open Water: Prevent standing water that could become stagnant.

M. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Erosion and Sedimentation Control Plan:

1. Submit not less than 30 days prior to anticipated start of clearing, grading, or other work involving disturbance of ground surface cover.

2. Include:

a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.

b. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.

c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.

d. Schedule of temporary preventive measures, in relation to ground disturbing activities.

e. Other information required by law.

f. Format required by law is acceptable, provided any additional information specified is also included.

3. Obtain the approval of the Plan by authorities having jurisdiction.

4. Obtain the approval of the Plan by Owner.

C. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.

D. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

PART 2 PRODUCTS

2.01 MATERIALS

A. Mulch: Use one of the following:

1. Straw or hay.

2. Erosion control matting or netting.

B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.

C. Bales: Air dry, rectangular straw bales.

1. Cross Section: 14 by 18 inches, minimum.

2. Bindings: Wire or string, around long dimension.

D. Bale Stakes: One of the following, minimum 3 feet long:

1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.

2. Wood, 2 by 2 inches in cross section.

E. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:

1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.

2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D4491/D4491M.

3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.

4. Tensile Strength: 100 pounds-force, minimum, in cross-machine direction; 124 pounds-force, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.

5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.

6. Tear Strength: 55 pounds-force, minimum, when tested in accordance with ASTM D4533/D4533M.

7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.

F. Silt Fence Posts: One of the following, minimum 5 feet long:

G. Gravel: See Section 31 2323 for aggregate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Construction Entrances: Traffic-bearing aggregate surface.

1. Width: As required; 20 feet, minimum.

2. Length: 50 feet, minimum.

3. Provide at each construction entrance from public right-of-way.

4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.

C. Linear Sediment Barriers: Made of silt fences.

1. Provide linear sediment barriers:

a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.

2. Space sediment barriers with the following maximum slope length upslope from barrier:
    a. Slope of Less Than 2 Percent: 100 feet..
    b. Slope Between 2 and 5 Percent: 75 feet.
    c. Slope Between 5 and 10 Percent: 50 feet.
    d. Slope Between 10 and 20 Percent: 25 feet.
    e. Slope Over 20 Percent: 15 feet.

D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
2. Straw bale row blocking entire inlet face area; anchor into pavement.

E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.

G. Soil Stockpiles: Protect using one of the following measures:
1. Cover with polyethylene film, secured by placing soil on outer edges.
2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.

H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.

I. Temporary Seeding: Use where temporary vegetated cover is required.

3.04 INSTALLATION

A. Traffic-Bearing Aggregate Surface:
1. Excavate minimum of 6 inches.
2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
3. Place and compact at least 6 inches of 1 1/2 to 3 1/2 inch diameter stone.

B. Silt Fences:
1. Store and handle fabric in accordance with ASTM D4873/D4873M.
2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
5. Install with top of fabric at nominal height and embedment as specified.
6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
7. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.

C. Straw Bale Rows:
1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
2. Install bales so that bindings are not in contact with the ground.
3. Embed bales at least 4 inches in the ground.
4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
5. Fill gaps between ends of bales with loose straw wedged tightly.
6. Place soil excavated for trench against bales on the upslope side of the row, compacted.

D. Mulching Over Large Areas:
1. Dry Straw and Hay: Apply 2-1/2 tons per acre; anchor using dull disc harrow or emulsified asphalt applied using same spraying machine at 100 gallons of water per ton of mulch.
2. Erosion Control Matting: Comply with manufacturer's instructions.

E. Mulching Over Small and Medium Areas:
1. Dry Straw and Hay: Apply 4 to 6 inches depth.
2. Erosion Control Matting: Comply with manufacturer's instructions.

F. Temporary Seeding:
1. When hydraulic seeder is used, seedbed preparation is not required.
2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
5. Incorporate fertilizer into soil before seeding.
6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep.

7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
8. Repeat irrigation as required until grass is established.

3.05 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
B. Repair deficiencies immediately.
C. Silt Fences:
   1. Promptly replace fabric that deteriorates unless need for fence has passed.
   2. Remove silt deposits that exceed one-third of the height of the fence.
   3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
D. Straw Bale Rows:
   1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
   2. Remove silt deposits that exceed one-half of the height of the bales.
   3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
E. Clean out temporary sediment control structures weekly and relocate soil on site.
F. Place sediment in appropriate locations on site; do not remove from site.

3.06 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.
B. Clean out temporary sediment control structures that are to remain as permanent measures.
C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

SECTION 01 5813 - TEMPORARY PROJECT SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project identification sign.

1.02 RELATED REQUIREMENTS

1.03 QUALITY ASSURANCE

A. Design sign and structure to withstand 50 miles/hr wind velocity.

B. Sign Painter: Experienced as a professional sign painter for minimum three years.

C. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Shop Drawing: Show content, layout, lettering, color, foundation, structure, sizes and grades of members.

PART 2 PRODUCTS

2.01 SIGN MATERIALS

A. Structure and Framing: New, wood, structurally adequate.

B. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch thick, standard large sizes to minimize joints.

C. Paint and Primers: Exterior quality, two coats; sign background of color as selected.

D. Lettering: Pre-cut vinyl self-adhesive products, color as shown on the drawings.

2.02 PROJECT IDENTIFICATION SIGN

A. One temporary sign of construction, design, and content indicated on drawings, location designated.

B. Graphic Design, Colors, Style of Lettering: Designated by Architect.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install project identification sign within 30 days after date fixed by Notice to Proceed.

B. Erect at designated location.

C. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.

D. Install sign surface plumb and level, with butt joints. Anchor securely.

E. Paint exposed surfaces of sign, supports, and framing.

3.02 MAINTENANCE

A. Maintain signs and supports clean, repair deterioration and damage.

3.03 REMOVAL

A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

END OF SECTION

SECTION 01 6000 - PRODUCT REQUIREMENTS

PART 1

1.01 Scope

A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
   1. Product standards and quality- substitutions
   2. Substitutions
   3. Manufacturer's directions
   4. Warranties
   5. Material delivery and responsibilities
   6. Protection
   7. Acceptance of equipment or systems

B. It is the intent of the Specifications and Drawings to accomplish a complete and first-grade installation in which there shall be installed new materials and products of the latest and best design and manufacturer. Workmanship shall be thoroughly first-class and complete, executed by competent and experienced workmen.

C. Equipment, specialties, and similar items shall be checked for compliance and fully approved prior to installation. Contractors are cautioned that work or equipment installed without approval is subject to condemnation, removal, and subsequent replacement with an approved item without extra remuneration.

D. Related Work Specified Elsewhere:
   1. Section 00200 INSTRUCTIONS TO BIDDERS.
   2. Section 013300 SUBMITTAL PROCEDURES.

E. Related Documents: The Work of this Section shall be included as a part of the Contract Documents of each Contractor or Subcontractor on this Project.

F. Definitions:
   1. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self explanatory and have well recognized meanings in the construction industry.
      a. "Products" are items purchased for incorporation in the Work, whether purchased for the project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
      b. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
   2. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form a part of the Work.
   3. "Equipment" is a product with operational parts, whether motorized or manually operated, that require service, connections, such as wiring or piping.

G. Quality Assurance:
   1. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
   2. Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products for use on the project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
      a. The Contractor is responsible for providing products and construction methods that are compatible with products and construction methods of subcontractors.
      b. If a dispute arises between contractors over concurrently selectable, but incompatible products, the Architect will determine which products shall be retained and which are incompatible and must be replaced.

H. Product Delivery, Storage, and Handling:
   1. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
      a. Schedule delivery to minimize long term storage at the site and to prevent overcrowding of construction spaces.
      b. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
      c. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
      d. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
      e. Store products on the site in a manner that will facilitate inspection and measurement of quality or counting of units.
      f. Store heavy materials away from the project structure in a manner that will not endanger the supporting construction.
      g. Store products subject to damage by elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2

2.01 Materials

A. Product Standards and Quality:
   1. The Contract is based on the materials, equipment, and methods described in the Contract
      a. Documents.
   2. Where in the Drawings and Specifications certain products, manufacturer's trade names, or catalog numbers are given, it is done for the expressed purpose of establishing a basis of quality, durability, and efficiency of design in harmony with the work outlined and is not intended for the purpose of limiting competition.
   3. The Architect will consider proposals for substitution of materials, equipment, and methods only when such proposals are accompanied by full and complete technical data and all other information required by the Architect to evaluate the proposed substitution.
   4. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved for this Work by the Architect.
      a. Refer to Section 00200 INSTRUCTIONS TO BIDDERS.
   5. "Or equal":
      a. Where the phrase "or equal" or "or equal as approved by the Architect" occurs in the Contract Documents, do not assume that material, equipment, or methods will be approved as equal by the Architect unless the item has been specifically approved for this Work by the Architect in an Addendum.
      b. The decision of the Architect shall be final.
   6. Availability of Specified Items:
      a. Verify prior to bidding that specified items will be available in time for installation during orderly and timely progress of the Work.
      b. In the event specified item or items will not be so available, so notify the Architect prior to receipt of bids.
      c. Costs of delays because of non-availability of specified items, when such delays could have been avoided by the Contractor, will be back charged as necessary and shall not be borne by the Owner.
   7. Voluntary Alternates: Bidders may, if they wish, submit materials and methods other than those described in these Contract Documents as voluntary alternates, provided that they are clearly identified and described on the Bid Form and that the Base Bid is based on materials and methods as described in the Contract Documents. Refer to Instructions To Bidders and Alternates: Section 01230.
   8. Where the questions of appearance, artistic effect, or harmony of design are concerned, the Architect reserves the right to refuse approval of substituted products proposed to be substituted for that specified, if in his opinion the item to be substituted is not harmonious to the finished effect and appearance desired, as portrayed in the Drawings and Specifications. The Architect's said refusal to approve, established by this paragraph, is final.
B. Substitutions:
   1. Substitutions: Changes in products, materials of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests of substitutions. The following are not considered to be requests for substitutions.
      a. Substitutions requested during the bidding period, accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
      b. Revisions to the Contract Documents requested by the Owner or Architect.
      c. Specified options of products and construction methods included in the Contract Documents.
      d. The Contractor's determination of and compliance with governing regulations and
      e. orders issued by governing authorities.
   2. Conditions: The Architect will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Architect. If the following conditions are not satisfied, the Architect will return the requests without action except to record non-compliance with these requirements:
      a. Extensive revisions to the Contract Documents are not required.
      b. Proposed changes are in keeping with the general intent of the Contract Documents.
      c. The request is timely, fully documented, and properly submitted.
      d. The specified product or method of construction cannot be provided within the Contract Time. The Architect will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
      e. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.
      f. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
      g. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
      h. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitutions provides the required warranty.
C. Manufacturer's Directions:
   1. Manufactured products shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the manufacturer's printed directions, unless herein specified to the contrary. Where manufacturer's printed directions are available and where reference is made to manufacturer's directions in the

Specifications, the Contractor shall submit 2 copies of such directions to the Architect prior to the beginning of Work covered thereby.

2. Where specific installation instructions are not part of these Specifications and Drawings, equipment shall be installed in strict accordance with instructions from the respective manufacturers. Where installation instructions included in these Specifications or Drawings are at a variance with instructions furnished by the equipment manufacturer, the Contractor shall make written request for clarification from the Architect.
3. In accepting or assenting to the use of apparatus or material, or make, or arrangement thereof, the Architect in no way waives the requirements of these Specifications or the warranty embodied therein.

D. Warranties:

1. Specific warranties or bonds called for in the Contract Documents, in addition to that falling under the general warranty as set forth in General Conditions, shall be furnished in accordance with the requirements of the Specifications.
   a. Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
   b. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.
      1) Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
2. Each Contractor shall and does hereby agree to warrant for a period of one year, or for longer periods, where so provided m the Specifications, as evidenced by the date of Substantial Completion issued by the Architect, products installed under the Contract to be of good quality in every respect and to remain so for periods described herein.
3. Should defects develop in the aforesaid Work within the specified periods, due to faults in products or their workmanship, the Contractor hereby agrees to make repairs and do necessary Work to correct defective Work to the Architect's satisfaction, in accordance with the General and Supplementary Conditions. Such repairs and corrective Work, including costs of making good other Work damaged by or otherwise affected by making repairs or corrective Work, shall be done, within 14 days after written notice to the Contractor by the Owner. without cost to the Owner and at the entire cost and expense of the Contractor.
   a. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
   b. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
4. Nothing herein intends or implies that the warranty shall apply to Work which has been abused or neglected or improperly maintained by the Owner or his successor in interest.
5. Where service on products is required under this Article, it shall be promptly provided when notified by the Owner and no additional charge shall be made, unless it can be established that the defect or malfunctioning was-caused by abuse or accidental damage not to be expected under conditions of ordinary wear and tear.
6. In the event movement in the adjoining structure or components causes malfunctioning, the Contractor responsible for the original installation of the adjoining structure or components shall provide such repair, replacement, or correction necessary to provide for proper functioning to bring the equipment back into the same operating condition as approved at the completion of the building.
7. The manufacturer and supplier expressly warrants that each item of equipment furnished by him and installed in this Project is suitable for the application shown and specified in the Contract Documents and includes features, accessories, and performing characteristics listed in the manufacturer's catalog in force on the date bids are requested for the Work. This warranty is intended as an assurance by the manufacturer that his equipment is not being misapplied and is fit and sufficient for the service intended. This warranty is in addition to and not in limitation of other warranties or remedies required by law or by the Contract Documents. It shall be the responsibility of the Contractor for the particular equipment to obtain this warranty in writing.
8. In case the Contractor fails to do Work so ordered, the Owner may have work done and charge the cost thereof against monies retained as provided for in the Agreement and, if said retained movies shall be insufficient to pay such cost or if no money is available, the Contractor and his Sureties shall agree to pay to the Owner the cost of such Work.

E. Material Delivery and Responsibilities:

1. Contractor shall be responsible for materials he orders for delivery to the jobsite. Responsibility includes, but is not limited to, receiving, unloading, storing, protecting, and setting in place; ready for final connections.
   a. The Owner will not be responsible for deliveries related to the construction or operation of the Contractor. The Owner cannot sign delivery forms for the Contractor.
2. Contractors shall insure that products are delivered to the Project in accordance with the Construction Schedule of the project. In determining date of delivery, sufficient time shall be allowed for shop drawings and sample approvals, including the possibility of having to resubmit improperly prepared submittals or products other than those specified and the necessary fabrication or procurement time along with the delivery method and distance involved.

F. Protection:

1. Each Contractor shall protect building elements and products when subject to damage. Should workmen or other persons employed or commissioned by one Contractor be responsible for damage, the entire cost of repairing said damage shall be assumed by said individual Contractor. Should damage be done by a person or persons not employed or commissioned by a Contractor, the respective Contractors shall make repairs and charge the cost to the guilty person or persons. The affected Contractors shall be responsible for collecting such charges. If the person or persons responsible for damage cannot be discovered, full and satisfactory repairs shall be made by the respective Contractor, and
   a. the cost of Work shall be prorated against the Contractor.
2. The respective Contractors shall protect their products prior to installation and final acceptance. Storage shall be dry, clean, and safe. Materials or equipment damaged, deteriorated, rusted or defaced due to improper storage, shall be repaired, refinished, or replaced, as required by the Architect. Products lost through theft or mishandling shall be replaced by the Contractor without cost to the Owner.

G. Acceptance of Equipment or Systems:

1. The Owner will not accept the start of the warranty period on systems or equipment until Substantial Completion notice is issued by the Architect to the Contractor releasing Owner's occupancy of the building, in part or whole. Each Contractor shall make such provisions as required to extend the manufacturer`s warranty from time of initial operation of systems or equipment until written notice of Substantial Completion is received.

END OF SECTION 016000

SECTION 01 6300 - SUBSTITUTIONS AND PRODUCT OPTIONS

SCOPE

1.01 Related Requirements:

A. Section 00 2000 INSTRUCTIONS TO BIDDERS: Article entitled SUBSTITUTIONS AND APPROVALS DURING BIDDING.

1. Conditions of the Contract.
2. Section 01 1000 SUMMARY OF WORK.

B. Standards and Named Products:

1. The naming of products and materials is done for the express purpose of establishing a basis of durability, efficiency, appearance and simplification of maintenance and not for the purpose of limiting competition. Other manufacturer's materials or articles may be used providing the material or article is presented to and approved by the Architect, subject to conditions hereinafter described.
2. Payment for changes in the work of others which are occasioned by substitutions shall be included as part of the substitution.
3. Proposals for substitutions will be considered only if said proposals increase the quality of the project, decrease the expenditure on the part of the Owner or are clearly superior to the products, materials, equipment, and methods specified herein. Proposals must be submitted using the “Substitution Request Form” contained herein. Proposals for substitutions which appear to be submitted only to decrease the expenditures on the part of the Contractor without a corresponding proposal for a reduction in the contract amount will not be entertained.
4. If a substitution is proposed resulting from availability problems with specified materials, proposals should also include consideration for modifications to the contract amount on behalf of the Owner. No request for an extension of the time of completion will be entertained by the Architect if such an extension is a result of the Contractor's lack of knowledge of the availability of the specified items.
5. All substitution requests shall address the following issues as a minimum for consideration:
   a. Provide complete manufacturer’s product information as required by Section 01 3300 SUBMITTAL PROCEDURES.
   b. List the specified product which is to be substituted.
   c. If the product is equal to that specified, state the proposed credit to the Owner.
   d. If the product is superior to that specified, explain in detail the advantages as well as any disadvantages.

END OF SECTION 016300

SECTION 01 6500 - STARTING OF SYSTEMS

SCOPE

1.01 Section Includes:

A. Starting systems.
   1. Demonstration and instructions.

B. Starting Systems:
   1. Coordinate schedule for start-up of various equipment and systems.
   2. Notify Architect, and Owner seven (7) days prior to start-up of each item.
   3. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
   4. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
   5. Verify wiring, controls and support components for equipment are complete and tested.
   6. Execute start-up under supervision of Contractor's personnel in accordance with manufacturers' instructions and recommendations.
   7. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
   8. Submit a written report that equipment or system has been properly installed and is functioning correctly.

C. Demonstration and Instructions:
   1. Demonstrate operations and maintenance of products to Owner's personnel at least two weeks prior to date of final inspection.
   2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
   3. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
   4. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at equipment location.
   5. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
   6. Video record all demonstrations, including questions and answers. Provide Owner with copy in VHS or DVD format.

D. Instructional Video Tapes/DVDs:
   1. Submit instructional video tapes/DVDs as part of close-out documents.
   2. Provide a video tape/DVD for each mechanical and electrical system including but not limited to boilers, air handling units and fan powered boxes, temperature control system, electrical panels, fire riser equipment and fire pumps, emergency generator, and fire alarm system, and as otherwise indicated in the documents wherever demonstration of equipment is required.
   3. Label and index all demonstrations on video tape/DVD. Provide comprehensive index of all video tapes/DVDs in close-out binder.
   4. A manufacturer's pre-recorded video tape/DVD may be substituted for the demonstration video/DVD.

END OF SECTION 16500

SECTION 01 7000 - EXECUTION

PART 1 GENERAL

1.01 Section Includes

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
   1. Construction Layout.
   2. Field Engineering and Surveying.
   3. Geotechnical/Soils Inspection/Sampling
   4. General Installation
   5. Coordination of Owner-Installed Products.
   6. Progress Cleaning.
   7. Starting and Adjusting Equipment
   8. Protection of Installed Construction.
   9. Correction of the Work.

1.02 Scope

A. Job Requirements: Immediately on discovery of the need for clarification of the Contract Documents, Contractor shall submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Do not overlook the requirements for the Certified Progress Surveys and the Final Property Survey.

B. Existing Condition Verification: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work. Verify the location and points of connection of utility services. The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction that may affect the Work. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services. Furnish location data for work related to Project that must be performed by public utilities serving Project site. Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction. Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.03 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of slavaged and relocated materials.

B. Section 01 3000 - Administrative Requirements: Submittals procedures; Electronic document submittal service.

C. Section 01 4000 - Quality Requirements: Testing and inspection procedures.

D. Section 01 5000 - Temporary Facilities and Controls: Temporary interior partitions.

E. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.

F. Section 01 7900 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific spedification sections.

G. Section 07 8400 - Firestopping.

1.04 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Work of Owner or separate Contractor.

1.06 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

C. Dust Control: Execute work by methods to miniize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispensing into atmosphere and over adjacent property.

D. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

E. Pest and Rodent Control: Provide methods, means and facilities to prevent pests and insects from damaging the work.

F. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
B. Notify affected utility companies and comply with their requiremen
C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicagted for pipes, ducts, and conduit, as closely as practcable, place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construciton. Coordinate locations of fixtures and outlets with finish elements.
F. Coordinate completion and clean-up of work of separate sections.
G. After owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.08 JOB REQUIREMENTS

A. The requirements set forth in Division I shall apply to all Contractors and/or Subcontractors. Throughout the body of the specifications, the terms "General Contractor", "Contractor", "Plumbing Contractor", "HVAC Contractor". "Mechanical Contractor", "Electrical Contractor", "Subcontractor", etc. are used and these terms shall indicate general and specific areas of responsibility. No "request for extra" will be entertained from any Contractor which arise our of interrpretation of this language. The work will be bid and pursed under one (1) general construction contract. Products not specified but meetng the specifications may be incorporated in the work provided they are approved in advance of the Architect.
B. Throughout the body of the specifications, from time to time, work required in one section and/or division of work is referred to from another section and/or division of work. Contractors are required to refer to all divisions of these specifications. The Contractor shall notify the Architect of the existence of any discrepancies found between the information contained in these plans and specification and actual field conditions. Notifications shall be in writing seven (7) business days prior to the inititation of Work. Failire to do so indicates acceptance buy the Contractor of the information listed.

1.09 SPECIAL REQUIREMENTS

A. The Contractor will submit a work schedule.
B. All work, except as noted otherwise, shall be performed between 7:00 am to 5:00 pm. Monday through Friday, excluding official state holidays. At each building and at the end of each day, remove all waste material, e.g. boxes, packing, debris, etc., and leave the area broom clean. Nails, sheet metal cut-offs and other sharp material shall be cleaned up regularly during the work. No such material shall remain at the end of the day.
C. Workman shall park their vehicles where directed. No parking will be permitted on access roads and mobilization areas. Fire lanes shall be kept clear at all times to maintain access to the existing buildings on the site.
D. All Contractors shall be licensed as required by local and state agencies. Contractors shall verify these requirements with the respective governing agencies.

PART 2 PRODUCTS

1.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

2.01 Construction Layout

A. Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
    1. Engage a land surveyor to lay out the Work using accepted surveying practices.
        a. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
        b. Establish dimensions within tolerances indicated. **Do not scale Drawings to obtain required dimensions.**
        c. Inform installers of lines and levels to which they must comply.
        d. Check the location, level and plumb, of every major element as the Work progresses.
        e. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
    2. Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
    3. Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations
    4. Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, and weather conditions

2.02 Field Engineering and Surveying

A. Identification: Owner will identify existing benchmarks, control points, and property corners.
B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
   1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
   2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
C. Benchmarks: Establish and maintain a minimum of two (2) permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
   1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
   2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
   3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
D. Certified Progress Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework. Submit four (4) copies to the Architect, showing the work performed. Record survey data.
E. Final Property Survey: Upon completion of construction, the Contractor shall furnish to the Architect four (4) copies of an As-built ALTA/ACSM Land Title Survey prepared in accordance with the Minimum Standard Detail Requirements adopted in 1992, showing the location on the Property of all improvements constructed thereon, and showing the location of all water, sewer, gas, and electric lines and mains, and of all existing easements and/or rights-of-way. Such survey shall be prepared by a licensed professional surveyor or civil engineer acceptable to the Owner, and who shall certify that the Work is installed and erected entirely upon the Property and within any building restriction lines on the Property, and does not overhang or otherwise encroach upon any easement or right-of-way of others.
   1. Include statement that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
   2. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
   3. Include an elevation certificate in accordance with NFIP requirements for flood determination purposes.
   4. At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

2.03 Geotechnical / Soils Inspection / Sampling
A. The soils engineer shall be on site to review cut and fill procedures to review and verify that existing soil composition is consistent with soils report and that attained compaction levels are in compliance with the specified requirements.
   1. Perform soil inspections during construction of building pad and foundation excavations.
   2. Should conditions vary from the soils report, the soils engineer shall notify the Architect immediately and render a recommendation on how best to proceed,
   3. Promptly notify Architect of irregularities or deficiencies in the work which are observed during performance of duties
   4. Promptly submit one copy of the report of inspections and test data to the Architect, submit two copies of those reports to the Contractor at the project site, and submit a single copy to the Owner.

2.04 Installation
A. Acceptance of Conditions: Examine substrates, areas, and conditions, with installer or applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
   2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.
B. Location: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
C. Compliance: Comply with manufacturer's written instructions and recommendations for installing products in applications indicated. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
D. Protection: Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels
F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation
H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

2.05 Owner-Installed Products
A. Provide access to Project site for Owner's construction forces and coordinate construction and operations of the Work with work performed by Owner's construction forces as required.
   1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
   2. Preinstallation Conferences: Include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

2.06 Progress Cleaning
A. Clean site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
   1. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
      a. Remove liquid spills promptly.
      b. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate
   2. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
   3. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
   4. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
   5. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

2.07 Starting and Adjusting Equipment
A. Starting: Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
B. Adjusting: Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
C. Testing: Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements.

2.08 Protection of Installed Construction
A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion. Comply with manufacturer's written instructions for temperature and relative humidity.
B. See Section 01 7610 for temporary protective covering materials.
C. Protect installed work from damage by construction operations.
D. Provide special protection where specified in individual specification sections.
E. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
F. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
G. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
H. Protect work from inclement weather that may cause deterioration or damage to any installed construction. This includes framing work that may be subject to wet conditions which over time could develop into an environmentally hazardous condition.
I. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.
J. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
K. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

2.09 Correction of the Work

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements for "Cutting and Patching." Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Restore permanent facilities used during construction to their specified condition. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

2.10 Alterations

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.
   2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
   1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
   2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Relocate items indicated on drawings.
   3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and special systems): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
      b. See Section 01 1000 for other limitations on outages and required notifications.
      c. Provide temporary connections as required to maintain existing systems in service.
   4. Verify that abandoned services serve only abandoned facilities.
   5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

F. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
   1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
   2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
   3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
   4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.

H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

I. Refinish existing surfaces as indicated:
   1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
   2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

J. Clean existing systems and equipment.

K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

L. Do not begin new construction in alterations areas before demolition is complete.

M. Comply with all other applicable requirements of this section.

2.11 Examination

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
C. Examine and verify specific conditions described in individual specification sections.
D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

2.12 Preparation
A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.
C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

2.13 Preinstallation Meetings
A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
B. Require attendance of parties directly affecting, or affected by, work of the specific section.
C. Notify Architect four days in advance of meeting date.
D. Prepare agenda and preside at meeting:
1. Review conditions of examination, preparation and installation procedures.
2. Review coordination with related work.
E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

2.14 Cutting and Patching
A. Whenever possible, execute the work by methods that avoid cutting or patching.
B. See Alterations article above for additional requirements.
C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to requiree
6. Repair new work damaged by subsequent work.
7. Remove samples of intalled work for testing when requested.
8. Remove and replace defective and non-complying work.
D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
G. Restore work with new products in accordance with requirements of Contract Documents.
H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.
J. Patching:
1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

2.15 Demonstration and Instruciton
A. See Section 01 7900 - Demonstration and Training.

2.16 Final Cleaning
A. Use cleaning materials that are nonhazardous.
B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
E. Clean filters of operating equipment.
F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and other areas as required.
G. Clean site; sweep paved areas, rake clean landscaped surfaces.
H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

2.17 Closeout Procedures

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect and Owner.
B. Architect will prepare a Certificate of Substantial completion for each specific portion of the work to be occupied before Owner occupancy.
C. Obrain a Certificate of Occupancy from authorities having jurisdiction before Owner Occupancy including state and local authorities.
D. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspection shall be successfully completed. On ocuupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of the building.
E. On occupancy, Owner will assume responsibility for maintenance and custodial services for occupied portions of the building.
F. The Contractor shall meet with the Owner to develop a schedule of work that meets the Owners requirements. The final schedule shall be approved by the Owner prior to start of construciton.
G. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List ffor Contractor's Notice of Substantial Completion.
H. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
I. Submit written certificatio containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
J. Conduct Substantial Completiong Inspection and create Final Correction Pinch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
K. Architect will prepare a Certificate of Substantial completion for each specific portion of the work to be occupied before Owner occupancy.
L. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspection shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of the building.
M. On occupancy, Owner will assume responsibility for maintenance and custodial services for occupied portions of the building.
N. The Contractor shall meet with the Owner to develop a schedule of work that meets the Owner's requirements. The final schedule shall be approved by the Owner prior to start of construction.
O. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
P. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspeciton.
Q. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

2.18 Maintenance

A. Provide service and maintenance of all installed components, equipment and systems.
B. Provied service and maintenance as indicated in specification sections, or if not indicated, according to manufacturer recommendations.
C. Maintenance Period: As indicated in specification sections or, if not indecated, not less than one year from the Date of Substantial Completion or the length of teh specified warranty, whichever is longer.
D. Examine system components at a frequency consistent with reliable operation . Clean, adjust, and lubricate as required.
E. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
F. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION 017000

SECTION 01 7200 - PROJECT RECORD DOCUMENTS

PART 1

1.01 Scope

A. At the site, maintain a “Project Record” copy of each of the following for Architect’s and Owner’s use:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Architect field orders or written instructions.
   6. Approved shop drawings, product data and samples.
   7. Field test records.
   8. Label each document “PROJECT RECORD” in neat, large printed letters.

B. Job Requirements: At contract close-out, deliver to the Architect (for the Owner) one set of reproducible as-builts of all sheets of the Contract Documents which have been corrected (by Contractor) to indicate all changes along with one Project Manual including addenda which have been corrected by Contractors to indicate all changes. Cost of reproducible mylars or sepias shall be borne by the General Contractor. All corrections shall be made using the same quality of linework, lettering, symbols, etc., as appears on the original Contract Documents.

PART 2

2.01 Recording

A. Record information concurrently with construction progress. Do not physically conceal any Work until required information is recorded.
   1. Drawings: Legibly mark to record actual construction.
      a. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
      b. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
      c. Field changes of dimension and detail.
      d. Changes made by Field Order or by Change Order.
      e. Details not on original Contract Drawings.
   2. Specifications and Addenda: Legibly mark each section to record:
      a. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
      b. Changes made by Field Order or by Change Order.

END OF SECTION 017200

SECTION 01 7400 - WARRANTIES AND BONDS

PART 1

1.01 Scope

A. Unless otherwise specified in respective specificatin section the General Contractor shall warrant all materials and workmanship for a period of 12 months beginning at the date of Substantial Completion or Permission to Occupy.

1. Any defective materials or workmanship shall be corrected or replaced without cost to the Owner during the warranty period.

B. This section covers furnishing two (2) copies of all warranties and bonds as part of the close-out requirements.

1. Related Requirements:

a. Conditions of the contract: Performance Bond and Payment Bonds.

b. Section 017300 OPERATIONS AND MAINTENANCE DATA.

c. Each Specification Section: Warranties and bonds required for specific products or work.

PART 2

2.01 Form of Submittals

A. Bind in commercial quality 8-1/2" x 11" three-ring side binders with durable and cleanable plastic covers.

B. Label cover of each packet with typed or printed title "WARRANTIES AND BONDS", with title of project, name, address and telephone number of Contractor, and name of responsible principal.

C. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the project manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

D. Separate each warranty or bond with index tab sheets, keyed to the Table of Contents listing. Provide full information, using separate type sheet as necessary.

1. Subcontractor, supplier and manufacturer, with name, address and telephone number of responsible principal.

2. Date of beginning and duration of warranty or bond.

3. Scope of responsibilities.

4. Instances which might affect the validity of warranty or bond.

5. Owner's procedures in the event of failure of product or work.

PART 3

3.01 Preparation of Submittals

A. Obtain warranties and bonds, executed in duplicate by responsible subcontractor, suppliers and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave data of beginning of time of warranty until the date of substantial completion is determined. Verity that documents are in proper form, full information is provided, and notarized. Co-execute submittals.

3.02 PART 4

3.03 Time of Submittals

A. Make submittals within ten days after date of Substantial Completion, prior to final application for payment.

B. For items of work when acceptance is delayed beyond date of Substantial Completion, submit within ten days after acceptance by Architect, listing the date of acceptance as the beginning of the warranty period

END OF SECTION 017400

SECTION 01 7419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Methods of trash/waste disposal that are not acceptable are:

1. Burning on the project site.
2. Burying on the project site.
3. Dumping or burying on other property, public or private.
4. Other illegal dumping or burying.

E. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 01 5000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

C. Section 01 6000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

D. Section 01 7000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

PART 3 EXECUTION

2.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 3000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 01 5000 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

2.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.

1. Prebid meeting.
2. Preconstruction meeting.
3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. Provide containers as required.
   2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 7610 - TEMPORARY PROTECTIVE COVERINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary protective coverings for installed floors, walls, other surfaces, and framing.

PART 2 PRODUCTS

2.01 GENERAL

A. Provide materials that are easily removed without damage to the surfaces covered and with the following characteristics:
   1. Water resistant.
   2. Vapor permeable.
   3. Impact resistant where necessary.
   4. Slip resistant where necessary

2.02 MATERIALS

A. Sheet Materials:
   1. Corrugated polypropylene sheet.
   2. Recycled paperboard/plastic composite sheet.
   3. Recycled paperboard sheet.
   4. Plywood, 1/2 inch thick nominal.

B. Rolled Materials:
   1. Self-adhering polyethylene film.
   2. Recycled cellulose fiberboard paper.
   3. Laminated glass fiber reinforced kraft paper.
   4. Rosin coated paper.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Trim or overlap sheet materials to fit area to be covered.

C. Roll out and cut rolled materials to fit area to be covered.

D. Stretch self-adhering film materials to completely cover surface.

3.02 REMOVAL

A. Remove protective coverings prior to Date of Substantial Completion. Reuse or recycle materials if possible.

END OF SECTION

SECTION 01 7800 - CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project record documents.
B. Operation and maintenance data.
C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
B. Individual Product Sections: Specific requirements for operation and maintenance data.
C. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.
C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site two sets of the following record documents to be provided to thw owner; record actual revisions to the Work:
   1. Drawings.
   2. Addenda.
   3. Change Orders and other modifications to the Contract.
   4. Reviewed shop drawings, product data, and samples.
   5. Manufacturer's instruction for assembly, installation, and adjusting.
B. Ensure entries are complete and accurate, enabling future reference by Owner.
C. Store record documents separate from documents used for construction.
D. Record information concurrent with construction progress.
E. Record Drawingsand Shop Drawings: Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.
   2. Details not on original Contract drawings.
   3. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
      a. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
         1) Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
         2) Accurately record information in an understandable drawing technique.
         3) Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
      b. Content: Types of items requiring marking include, but are not limited to, the following:
         1) Dimensional changes to Drawings.
         2) Revisions to details shown on Drawings.
         3) Depths of foundations below first floor.
         4) Locations and depths of underground utilities.
         5) Revisions to routing of piping and conduits.
         6) Revisions to electrical circuitry.
         7) Actual equipment locations.
         8) Duct size and routing.
         9) Locations of concealed internal utilities.
         10) Retain Work Change Directive in first subparagraph below if using EJCDC Document 1910-8.
         11) Changes made by Change Order or Construction Change Directive.
         12) Changes made following Architect's written orders.
         13) Details not on the original Contract Drawings.

14) Field records for variable and concealed conditions.
15) Record information on the Work that is shown only schematically.
c. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
d. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
e. Mark important additional information that was either shown schematically or omitted from original Drawings.
f. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

F. Record Specifications:
1. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
3. Delete two subparagraphs below if provisions are too elaborate, or revise to suit Project.
4. Retain first subparagraph below with or without subparagraph above, where this record is desired.
a. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
b. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

G. As Built Survey:
1. General Contractor shall be responsible for contracting with surveying company to complete an as built survey to document final construction and site conditions.
2. Survey requirements shall meet ALTA standards: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
a. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

H. Record Product Data:
1. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
a. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
b. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
c. If possible, a Change Order proposal should include resubmitting updated Product Data. This eliminates the need to mark up the previous submittal.
d. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

3.02 OPERATION AND MAINTENANCE DATA - GENERAL
A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES
A. For Each Product, Applied Material, and Finish:
B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
D. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS
A. For Each Item of Equipment and Each System:
1. Description of unit or system, and component parts.
2. Identify function, normal operating characteristics, and limiting conditions.
3. Include performance curves, with engineering data and tests.
4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
E. Provide servicing and lubrication schedule, and list of lubricants required.
F. Include manufacturer's printed operation and maintenance instructions.
G. Include sequence of operation by controls manufacturer.
H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
I. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
J. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
D. Prepare data in the form of an instructional manual.
E. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 1/2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
L. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
M. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.
N. In addition to hard printed copies of all instruction manuals provide same information digitally to the owner on CD or DVD in standard software format. Clearly label contents of each disk.

3.06 WARRANTIES AND BONDS

A. Unless otherwise specified in respective specification section the General Contractor and each Subcontractor shall warrant all materials and workmanship for a period of 12 months beginning at the date of Substantial Completion or Permission to Occupy.
   1. Any defective materials or workmanship shall be corrected or replaced without cost to the Owner during the warranty period.
B. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
C. Verify that documents are in proper form, contain full information, and are notarized.
D. Co-execute submittals when required.
E. Retain warranties and bonds until time specified for submittal.
F. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
G. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
H. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
I. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

SECTION 01 7823 - OPERATING AND MAINTENANCE DATA

PART1

1.01 Scope

A. This section covers furnishing two (2) hard copies and two (2) electronic copies of Operating and Maintenance Data as part of the Close-Out Requirements.

PART 2

2.01 Content and Format

A. Provide bound operations and maintenance data manuals covering all systems, equipment and materials as installed. Manuals shall contain the following:
   1. Diagrams of all systems, including temperature control system.
   2. Approved equipment drawings and data clearly marked for equipment furnished.
   3. Complete operating and maintenance instructions for each system and item of equipment, setting forth in detail and step-by-step the procedure for starting, stopping, operating and maintaining the entire system as installed.
   4. Exploded view and a parts list of all items of equipment.
   5. A complete valve tag list including the name and function of the pipe in which the valve is mounted.
   6. Any special emergency operating instructions and a list of service organizations (including addresses and telephone numbers) capable of rendering emergency service to the various parts of the system.
   7. A certified log of air quantities at all air supply, return and exhaust openings as approved by the Architect.
   8. ASME and State pressure vessel inspection forms.
   9. All motor data, including standard and actual operating in service data.
   10. Manufacturer's equipment guarantees.
   11. Complete maintenance instructions for all materials installed, i.e., flooring, wall coverings, windows, builders hardware, etc.

B. Provide, in a separately indexed section of the manual, a complete comprehensive schedule of maintenance intervals for each system and each piece of equipment installed requiring any periodic maintenance, i.e., daily, bi-weekly, or bi-monthly, monthly, quarterly, semi-annually and annually. Include in the manual a schedule of filters, to include size, media type, cleaning interval, listed by A.H.U. No. and location.

C. Instruct the Owner or his selected representatives (via demonstration) as to the proper care and maintenance of each system, item of equipment and materials and provide signed acknowledgment from personnel receiving such instruction in the bound manuals following the data for that system or item.

D. Hard-copy Manuals shall be loose leaf with fiberboard covers. Each sheet shall be reinforced to prevent tearing from continued use, and each manual shall have the following information clearly printed on its cover:
   1. Project name, name of Owner and address.
   2. Name and address of Architect.
   3. Contractor and Subcontractor names, addresses, department to contact and telephone numbers, including night and emergency numbers.
   4. Supplier names and telephone numbers.
   5. Name and telephone number of manufacturer's authorized representative.

E. Electronic Manuals shall be supplied by CD submittal, containing all information in PDF or CAD format. CD shall be organized and contain an index of information. Each electronic manual shall have the following information printed on its cover:
   1. Project name, name of Owner and address
   2. Name and address of Architect.
   3. Contractor and Subcontractor names, addresses, department to contact and telephone numbers, including night and emergency numbers.

F. Job Requirements: Operating and maintenance data submittals shall be reviewed by the Architect prior to authorizing release of final retainage at completion and shall be updated to include additions, changes and acknowledgments which shall be approved by the Architect prior to authorizing final payment.

END OF SECTION 017823

SECTION 01 7900 - DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Demonstration of products and systems to be commissioned and where indicated in specific specification sections.

B. Training of Owner personnel in operation and maintenance is required for:
   1. All software-operated systems.
   2. HVAC systems and equipment.
   3. Plumbing equipment.
   4. Electrical systems and equipment.
   5. Conveying systems.
   6. Landscape irrigation.
   7. Items specified in individual product Sections.

C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
   1. Items specified in individual product Sections.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority.
   2. Submit one copy to the Commissioning Authority, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Authority.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of overall Training Plan; submit in editable electronic format, Microsoft Word 2003 preferred.

B. Draft Training Plans: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
   1. Submit to Commissioning Authority for review and inclusion in overall training plan.
   2. Submit not less than four weeks prior to start of training.
   3. Revise and resubmit until acceptable.
   4. Provide an overall schedule showing all training sessions.
   5. Include at least the following for each training session:
      a. Identification, date, time, and duration.
      b. Description of products and/or systems to be covered.
      c. Name of firm and person conducting training; include qualifications.
      d. Intended audience, such as job description.
      e. Objectives of training and suggested methods of ensuring adequate training.
      f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
      g. Media to be used, such a slides, hand-outs, etc.
      h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.

C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
   1. Include applicable portion of O&M manuals.
   2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
   3. Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Training Reports:
   1. Identification of each training session, date, time, and duration.
   2. Sign-in sheet showing names and job titles of attendees.
   3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.
   4. Include Commissioning Authority's formal acceptance of training session.

E. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
   1. Format: DVD Disc.
   2. Label each disc and container with session identification and date.

1.03 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
   1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
   2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.

B. Demonstrations conducted during Functional Testing need not be repeated unless Owner personnel training is specified.

C. Demonstration may be combined with Owner personnel training if applicable.

D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.
   2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

A. Commissioning Authority will prepare the Training Plan based on draft plans submitted.
B. Conduct training on-site unless otherwise indicated.
C. Owner will provide classroom and seating at no cost to Contractor.
D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Authority.
E. Provide training in minimum two hour segments.
F. The Commissioning Authority is responsible for determining that the training was satisfactorily completed and will provide approval forms.
G. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.
H. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
   1. The location of the O&M manuals and procedures for use and preservation; backup copies.
   2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
   3. Typical uses of the O&M manuals.
I. Product- and System-Specific Training:
   1. Review the applicable O&M manuals.
   2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
   3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
   4. Provide hands-on training on all operational modes possible and preventive maintenance.
   5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
   6. Discuss common troubleshooting problems and solutions.
   7. Discuss any peculiarities of equipment installation or operation.
   8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
   9. Review recommended tools and spare parts inventory suggestions of manufacturers.
   10. Review spare parts and tools required to be furnished by Contractor.
   11. Review spare parts suppliers and sources and procurement procedures.
J. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

SECTION 018113

SUSTAINABILITY DESIGN REQUIREMENTS

St. Theresa Village

PART 1 GENERAL

GENERAL CONDITIONS

A. The General Conditions, Modifications to General Conditions, Supplementary or Special Conditions and any Instructions to Bidders shall apply to all Divisions of work.
B. The requirements of State, Local or appropriate codes applicable to the work, whichever is the most stringent is a requirement of all Divisions of work.

WORK OF THIS SECTION

A. Section includes:
    1. Sustainable Project Goals
    2. Enterprise Green Communities Certification requirements
B. The intent of this project is to achieve an Enterprise Green Communities 2020 certification.
C. Contractor shall coordinate work and requirements with Owner Contracted Green Rater/Verifier for Green certifications. Pertinent to green certifications the role of the Green Rater/Verifier is to guide the construction team with certification process; review documentation, verify green requirements are met; and to perform third-party testing.

REFERENCES

A. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
    1. ASHRAE 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
    2. ASHRAE 62 - Ventilation for Acceptable Indoor Air Quality.
    3. ASHRAE 90.1 - Energy Efficient Design of New Buildings except Low-Rise Residential Buildings.
    4. ASHRAE 129 - Measuring Air-Change Effectiveness.
B. ASTM International:
    1. ASTM E408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
    2. ASTM E903 - Standard Test Method for Solar Absorption, Reflectance, and Transmittance of Materials Using Integrating Spheres.
C. Forest Stewardship Council: FSC Guidelines- Forest Stewardship Council Guidelines.
D. Sheet Metal and Air Conditioning Contractors: SMACNA IAQ - IAQ Guidelines for Occupied Buildings under Construction.
E. South Coast Air Quality Management District: SCAQMD Rule 1168 - Adhesive and Sealant Applications.
F. South Coast Air Quality Management District: SCAQMD Rule 1113 – Interior paints, coatings, and primers.
G. SCS Global Services Recycled Content Certification
H. California Department of Public Health (CDPH) emission standard, formerly California 01350 – VOC emission limits
I. CARB Phase 2 – composite wood formaldehyde emissions testing standard
J. American National Standards Institute (ANSI) / American Water Works Association (AWWA) C810-17 Standard
K. National Pollutant Discharge Elimination System (NPDES)'s Stormwater Discharges from Construction Activities guidance
L. U.S. Environmental Protection Agency:
    1. EPA Baseline IAQ - Testing for Indoor Air Quality, Baseline IAQ, and Materials Section 01445.
    2. EPA 402-K-01-002 – A Step-by-Step Guide on how to Build Radon-Resistant Homes

M. Enterprise Green Communities:
    1. Green Communities Checklist 2020
    2. Green Communities Criteria 2020
N. ENERGY STAR Qualified Homes Program Requirements
    1. https://www.energystar.gov/partner_resources/residential_new/homes_prog_reqs/national_page

SUBMITTALS
A. The contractor shall submit the following items directly to the Green Rater/Verifier.
B. Construction Waste Diversion Rate (Calculation and/or Waste Tickets)
C. The contractor shall submit cut-sheets of products intended to comply with Environmentally Preferable Products (EPP). See Green Communities Checklist Section 6 for list of products intended to meet this requirement. EPP criteria are as follows:
    1. Ingredient Transparency for Material Health Requirement – Publicly disclosed where content is characterized and screened using health hazard lists or restricted substances lists to 1,000 ppm
    2. Recycled Content and Ingredient Transparency Requirement – Minimum 25% post-consumer
    3. Chemical Hazard Optimization Requirement – Third-party verification of optimization to 100 ppm.
    4. Healthier Materials Selection Requirement – see specific requirements for low-emission paints, coatings, primers, wallpaper, adhesives, sealants, flooring, insulation, and composite wood under criterion 6.4.
    5. Environmentally Responsible Material Requirement – see specific requirements for embodied emissions for concrete, steel, insulation, roofing, paving, and non-composite wood under criterion 6.5
    6. Regional Materials Requirement – Extracted, manufactured, and fabricated (all processes) within 500-mile crow-fly distance of site.

QUALITY ASSURANCE
A. Perform work in accordance with the Enterprise Green Communities Criteria for prerequisites and credits pertinent to this project listed in Green Communities worksheet included at the end of this section.
B. Maintain one copy of Green Communities Criteria on site. Criteria is available for download at https://www.greencommunitiesonline.org/sites/default/files/egc_2020_criteria_manual.pdf
C. Thoroughly review any requests for substitution for products that are related to Enterprise Green Communities prerequisites and credits. Any substitutions may jeopardize projects' ability to obtain certification.
D. Perform storm water management and erosion control Work in accordance with EPA Best Management Practices or local erosion and sedimentation control standards whichever is more stringent.
E. Perform Work to meet or exceed minimum energy efficiency and performance in accordance with Energy Star requirements. Energy Star Checklist is enclosed at end of this section.
F. Perform Work without use of CFC based refrigerants in HVAC building systems.
G. Perform ventilation Work in accordance with ASHRAE 62.
H. Develop and implement construction indoor air quality management plan including the following:
    1. Comply with minimum requirements of SMACNA IAQ.
    2. Protect stored and installed absorptive materials from moisture damage.
        a. Store materials on elevated platforms under cover, and in dry location.
        b. When materials are not stored in enclosed location, cover tops and sides of material with secured waterproof sheeting.
    3. Protect HVAC equipment during construction.
        a. Shut down return side of HVAC system whenever possible during heavy construction or demolition.
        b. When HVAC systems are operated during heavy construction, furnish disposable temporary filters.

PART 2 PRODUCTS

PRODUCT SUBSTITUTION

A. Thoroughly review any requests for substitution for products that are related to Green Communities prerequisites and credits. Any substitutions may jeopardize the project's ability to obtain certification.

PART 3 EXECUTION

EGC 1.4 Integrative Design: Construction Management (mandatory)

1. At the onset of construction organize an Enterprise Green Communities trades training moderated by Green Verifier.
2. Following trades to attend - GC Project Manager, GC Site Superintendent, Mechanical-Electrical-Plumbing, Insulation, Framing, Drywall, Air-Infiltration Package.
3. Provide a minimum of 2-week notice to Green Verifier prior to training date.

EGC 2.1 Site Selection (mandatory)

This project does not have any ecologically sensitive features.
If ecologically sensitive features are identified in the Ecological Resource Protection Zone (ERPZ) meet the following:

1. Protect floodplain functions
   Rehabilitation
   a. Projects built on land that is within the Special Flood Hazard Area (SPHA) as identified by FEMA, must be designed to meet the ASCE 24 Flood Resistant Design and Construction standard.
   a. Ensure that any development or redevelopment activities within the floodplain will mitigate and improve existing floodplain conditions (maintain or increase existing floodplain storage, improve water quality, implement flood-resilient design).
   b. Do not raise topographical elevations in flood zones.
2. Protect aquatic ecosystems
   Rehabilitation.
   a. Do not extend the building, built structures, roads, or parking areas into wetlands or deepwater habitats, as identified in the ERPZ, beyond where they already exist.
   b. Develop restoration plans for wetland and deepwater habitats within the ERPZ.

All Projects

3. Conserve habitat for any species on federal or state threatened or endangered lists
   a. Do not extend the building, built structures, roads, or parking areas into habitats for threatened and endangered plant and animal species on the site, as identified in the ERPZ.
   b. Minimize disturbances within the ERPZ during construction. If construction activities permanently disrupt the habitat of threatened or endangered animal habitats, follow the guidance of responsible state (or local) agencies on how to best address.

EGC 3.1 Environmental Remediation (mandatory)

1. Submit Phase 1 Environmental Site Assessment report to Green Verifier/Verifier
   If an environmental site assessment reveals any hazardous materials, mitigate these before proceeding with development.

EGC 3.2 Erosion and Sedimentation Control (mandatory)

Applies only when any site-work or excavation is in scope:
Contractor shall implement EPA's National Pollutant Discharge Elimination System (NPDES)' Stormwater Discharges from Construction Activities guidance, or local requirements, whichever is more stringent. If excavation and site work is part of scope:

1. Stockpile and protect disturbed topsoil for reuse.
2. Control the path and velocity of runoff with silt fencing or equivalent.

3. Protect sewer inlets, streams, and lakes on site during construction with silt fencing, silt sacks or comparable measures.
4. Provide swales to divert surface water from hillsides.
5. Identify and protect significant, high value trees during construction with fencing outside the critical root zone.
6. If soil is disturbed during construction on sloped areas, use tiers, erosion blankets, compost blankets, etc. to stabilize soil.

EGC 3.3 Ecosystem Services/ Landscape (mandatory)

When new landscaping is provided, or existing landscaping is modified:

1. All new landscaping (trees, shrubs, and groundcover, including grasses) should be native or adapted to the region. All new plants must be appropriate to the site's soil and microclimate, and none should be invasive species.
2. All disturbed existing landscape areas should be reseeded with native groundcover or plans and mulch.

EGC 4.1 & 4.2 Water-Conserving Fixtures (mandatory)

1. Service pressure in each unit must not exceed 60 psi. Provide documentation of municipal water pressure. Green verifier will test water pressure at units.
2. Following flow rates are required to reduce total indoor water consumption by **30%**:
3. Toilets must be **WaterSense certified** and **1.28** gallons per flush or less, including dual-flush and pressure-assisted models.
4. Urinals must be **WaterSense certified** and **0.5** gallons per flush or less.
5. Showerheads must be **WaterSense-labeled** and **1.5** gallons per minute or less.
6. Kitchen faucets must be **1.5** gallons per minute or less.
7. Lavatory faucets must be **WaterSense certified** and **1.2** gallons per minute or less.

EGC 5.1b Building Performance Standard (mandatory)

ERI Option

Demonstrate energy performance equivalent to a HERS Index of **80**: Energy Analysis conducted by Green Verifier confirms that the project is below HERS **80** target. On-site power generation may not be used to satisfy the minimum energy performance. Meeting energy performance standards further requires mandatory inspection and testing conducted by Owner Contracted Green Rater/Verifier for Green certifications.

Conduct compartmentalization of dwelling units via air infiltration no greater than 0.40 CFM50 for Moderate Rehab per square feet of dwelling unit enclosure area or a 20% improvement of CFM50/sf compared to pre-retrofit conditions, following procedures in ANSI/RESNET/ICC Std. 380.

Insulation installed as part of the rehab must achieve the following:

1. Grade I installation per ANSI/RESNET/ICC Std. 301.
2. Grade II installation for assemblies that contain a layer of continuous, air impermeable insulation (≥ R-3 in Climate Zones 1 to 4, ≥ R-5 in Climate Zones 5 to 8).
3. Grade II batt insulation floors if they fill the full width and depth of the floor cavity, even when compression occurs due to excess insulation.

HVAC systems repaired or installed during rehab must complete testing via the National HVAC Functional Testing Checklist, ENERGY STAR Multifamily New Construction Version 1.1 (or most recent checklist version available at time of permit).

Mandatory Mid-Construction Pre-Drywall Thermal Bypass Inspection:

1. EGC Certification will require visual inspection of thermal envelope per enclosed Energy Star Rater Field Checklist at mid-construction. Coordinate inspection with Green Verifier with a minimum of 3-week notice. (Only applicable-scope items will be inspected for renovations.)

Final Verification and Inspection Testing

1. Upon substantial completion and prior to occupancy, the Green Verifier will conduct a visual Final Inspection to verify green requirements incorporated in the project. The contractor shall notify the Green Rater at least four (4) weeks prior to the anticipated date for such inspection. Contractor shall provide access to each unit and cooperate with conducting of the test. Additional inspections necessary due to incomplete work shall be back-charged to the Contractor.
2. Testing - Third-party Testing is to be scheduled and conducted in conjunction with the final inspection. The contractor shall notify the Green Verifier at least four (4) weeks prior to the anticipated date for such inspection. Contractor shall provide access to each unit and cooperate with conducting of the test.
3. Preconstruction Pretest – A pre-construction pretest was conducted to identify areas to envelope, demising unit enclosures. Recommended areas for sealing include:
    a. Joints between duct boots and drywall and floor finishes.
    b. Gaps at plumbing penetrations to drywall and floor finishes.
    c. Plumbing and attic access panels.
    d. Seal all visible gaps and cracks where interstitial cavities (wall, joist, ceiling, and stair) are used as return ducts.
4. Air Infiltration Test (Blower door Test) – Mandatory – Measures air leakage through unit enclosure such as exterior walls, demising walls, ceilings, chases, etc. Minimum envelope leakage where applicable. Following areas of building envelope and demising walls shall be sealed, caulked, gasketed, or weather-stripped to minimize envelope leakage:
    a. Joints around exterior doors and windows.
    b. Joints between walls and foundation; between conditioned spaces and attics, demising walls, crawl spaces and garage.
    c. All mechanical, plumbing, and electrical penetrations in exterior and demising walls. Mechanical chase shall be sealed at crawl space ceiling.
    d. Exterior sheathing and house wrap.
    e. Minimize entry of air from outside, attic, garage, and crawl space into exterior wall and interior wall cavities to ensure passing of air infiltration test. Also minimize air transfer from unit to unit, and unit to corridor.
    f. Batt insulation shall be stapled to face of stud to ensure full contact of insulation with face of drywall. Cut insulation around all mechanical, plumbing, and electrical work.
    g. Gasket attic access panels. Seal drywall to frame of access panel.
5. Distribution Loss Test (Duct Blaster Test) – Mandatory – Measures leakage through the mechanical distribution system and minimize duct leakage. Following areas HVAC distribution system shall be sealed:
    a. Clean entire distribution system to decipher areas for sealing and minimizing duct leakage.
    b. Joints and seams of existing ductwork shall be sealed where visible.
    c. Provide new metal lining for returns in visible areas where wall and floor cavities are used for returns.
    d. Seal all duct boots in floors to subfloors and seal all duct boots in walls to drywall.
    e. Seal gaps between drywall and all duct penetrations in ceilings, including exhaust fans.

EGC 5.6 Sizing of Heating and Cooling Equipment (mandatory)

Applicable to rehabs that include replacement of heating and cooling equipment.

1. Size and select heating and cooling equipment in accordance with the Air Conditioning Contractors of America (ACCA) Manuals J and S or ASHRAE handbooks.

EGC 5.7 Energy Star Appliances (mandatory)

1. If replacing or installing new appliances provide Energy Star-labeled refrigerators, dishwashers, and clothes washers.

EGC 5.8 Lighting (mandatory)

When replacing or installing new light fixtures

1. All permanently installed fixtures shall be high-efficiency that is capable of meeting recommended light levels in the Illuminating Engineering Society Handbook, 10th edition.

2. Recessed light fixtures installed as part of air barrier shall be Insulation Contact Air-Tight (ICAT)
3. Common space lighting or Non-apartment building spaces must be controlled by occupancy sensors or automatic bi-level lighting controls, except 24-hour lighting required by code.
4. Lighting power density in dwelling units shall be 1.1 W/SF or less.
5. All exterior lighting shall have motion sensor controls, integrative PV cells, photosensors, or astronomic time-clock operation.
6. Exterior fixtures shall meet the following:
    a. Luminaires shall be fully shielded emitting no light above 90 degrees. The luminaire's mounting hardware shall not permit mounting in any configuration other than those maintaining full shielding. Non-residential luminaires shall have an uplight rating of U0.
    b. Fixtures shall have no sag or drop lenses, side light panels or uplight panels.
    c. Fixtures shall employ warm-toned (3000k or lower) white light sources or may employ amber light sources or filtered LED light sources.

EGC 6.4 Healthier Material Selection (mandatory)

1. Use products that comply with the following requirements.

PRODUCT CATEGORY	MANDATORY	ADDITIONAL POINTS	REFERENCE
All interior paints, coatings, primers and wallpaper	VOC content less than or equal to the thresholds provided by the most recent version of SCAQMD 1113 available at time of product specification for all interior paints, coatings and primers. VOC emissions verified as compliant with CDPH Standard Method for all wall finish paints. All wallpaper, phthalate free	1 point per APE-free paint, coating and/or primer 1 point per CDPH-compliant coating and/or primer (excluding wall finish paints) *[2 points maximum]*	For wall finish paints compliant with the mandatory CDPH specification, seek those certified to Master Painters Institute (MPI) X-Green, Green Wise Gold, GREENGUARD Gold, SCS Indoor Advantage Gold, and Berkeley Analytical ClearChem. GS-11 paints comply with the optional APE-free criterion, as do Red List–free products.
All interior adhesives and sealants	VOC content less than or equal to the thresholds provided by the most recent version of SCAQMD 1168 available at time of product specification for all interior adhesives and sealants.	Use of sealants that do not contain orthophthalate plasticizers. Use of adhesives that are CDPH compliant. *[1 point per compliant product, 2 points maximum]*	Orthophthalate plasticizers are common in polyurethane and modified polymer sealants. While not common, they may also be found in some acrylic latex or siliconized acrylic sealants. Verify that specified sealants are phthalate-free. Minimize the need for adhesives when possible. For instance, finger-joints and mechanical fasteners do not contain chemicals of concern.
Flooring	All flooring products (whether carpet or hard surface) must comply with CDPH emission requirements. No flexible PVC with phthalates may be installed, whether the phthalates were intentionally added or added via recycled content.	The project complies with one of the following options: Absence of vinyl-flooring throughout the project Absence of carpet throughout the project All project flooring assemblies	Common flooring product labels that meet or exceed the mandatory CDPH emission requirement include FloorScore, GREEN-GUARD Gold, SCS Indoor Advantage Gold, Berkeley Analytical ClearChem, and Carpet Rug Institute Green Label Plus (CRI+). In place of vinyl or other PVC-based resilient flooring, consider salvaged hardwoods, natural linoleum, rubber, cork, other PVC-free resilient flooring, ceramic or stone tile, sealed concrete, or

	No carpet in the project may be installed in building entryways, laundry rooms, bathrooms, kitchens/kitchenettes, or utility rooms. Fluid applied finish floors may only be installed in non-occupied spaces, such as mechanical rooms.	(adhesive, sealant, flooring product) are Red List-free *[3 points]* If using carpet, specify those that do not use a fluorinated (PFAS) stain repellant. *[1 point]*	pre-finished solid wood flooring. Pre-finished products, compared to those finished on site, keep potential exposures lower through a more controlled environment during finishing. If possible, use a floor system that can feature mechanical attachments (e.g., nails, floating wood flooring) instead of glues. This approach makes flooring easier to recycle in the future.
Insulation	If fiberglass or mineral wool batts are used, these must be formaldehyde-free.	The project does not include any two-part spray polyurethane foam. *[2 points]* The project uses board insulation that does not contain halogenated flame retardants. *[3 points]*	Alternative insulation products include recycled cotton, cellulose, wool, and blown fiberglass. All major U.S. manufacturers of residential fiberglass batt insulation have transitioned to formaldehyde-free products. Some formaldehyde-free mineral wool batts are also available
Composite wood	Formaldehyde emissions less than or equal to the thresholds provided by CARB Phase 2 and/or TSCA Title IV for plywood, particleboard, MDF, and these materials within other products like cabinets and doors. For any other composite wood products not covered by CARB/TSCA requirements, but used in interior spaces, these must at minimum be NAUF (have no added urea formaldehyde).	Use of composite woods that are certified ultra-low emitting formaldehyde (ULEF). 1 point per product. [2 points maximum]	While finish products (including plywood, MDF, particleboard, and cabinet and door components) comply by law with this mandatory requirement, ensure that all products installed in the project that are exposed to the conditioned space meet these standards or at a minimum do not include added urea formaldehyde. No-added formaldehyde (NAF) products qualify as ULEF and will be eligible for optional points. However, be aware that the alternative binders utilized in these products may include regrettable substitutions. For instance, the most common alternative binder for composite wood is PMDI, which is made with isocyanates. PMDI is expected to be a lower hazard during use than formaldehyde, but more information is needed. Preferable alternatives would be more than half bio-based (e.g., binders that are at least 50% soy) with full content disclosure, so they can be vetted for health hazards.

EGC 6.6 Bath, Kitchen, Laundry Surfaces (mandatory)

1. Use materials that have durable, cleanable surfaces through bathrooms, kitchens, and laundry rooms. Materials should not be prone to deterioration due to moisture intrusion or encourage the growth of mold.
2. Use moisture-resistant backing materials such as cement board, fiber cement board, or equivalent per ASTM #D 6329 or ASTM #D 3273 behind tub/shower enclosures. Projects using a one-piece fiberglass enclosure are exempt from this requirement.

EGC 6.9 Managing Moisture: Roofing and Wall Systems (mandatory)

Applicable only when wall or roof systems are replaced.

Walls

1. Provide a continuous housewrap /weather-resistive barrier with sheets lapped shingle-style to prevent bulk water that penetrates the finished exterior cladding system from entering the wall assembly or being introduced through window or door openings or through other penetrations. Alternatively, install a fluid applied weather-resistive barrier in accordance with manufacturer's instructions.
2. Flashings at roof /wall intersections and wall penetrations (i.e., plumbing, electrical, vents, HVAC refrigerant lines and the like in addition to windows and doors) must be integrated with the weather-resistive barrier and drainage plane prior to any exterior finish being installed to prevent bulk water from entering the exterior wall assembly.
3. Flashing installed at bottom of exterior walls with weep holes included for masonry veneer and weep screen for stucco cladding systems or equivalent drainage system.

Roof

1. Install drip edge at entire perimeter of roof.
2. At wall /roof intersections, maintain ≥2" clearance between wall cladding and roofing materials, install flashing along the intersection, and use kick-out flashing.

EGC 6.10 Construction Waste Management (mandatory)

Contractor to investigate local options for diversion of all construction waste and develop a plan for tracking waste diversion either through a contracted company or by tracking and sorting following components of construction waste.

Option 1

1. Recycle a minimum of **75%** of total construction waste

<u>OR</u>

Option 2

1. Select at least two of the following waste streams and recycle 100% of those waste streams:
    a. Cardboard
    b. Wood
    c. Metal
    d. Drywall
    e. Concrete, brick and/or asphalt
    f. Insulation, foam, and plastics
    g. Carpet

Option 3

1. Reduce total construction waste to less than **2.5** lbs./SF.

EGC 7.3 Combustion Equipment (mandatory)

Applicable only when combustion equipment is provided **anywhere in the building**:

1. Provide at least one hard-wired carbon monoxide detector with battery backup for each sleeping area, minimum one on each floor.
2. Any combustion equipment installed must be power-vented or closed-combustion.
3. For Moderate Rehabs with combustion equipment that is not power-vented or direct-vent, Owner AND/OR Contractor to confirm pre-construction combustion safety test was conducted. The test

must be conducted for central systems and for 10% of individual dwelling units systems per RESNET Guidelines for Combustion Safety and Developing Work Orders or BPI Combustion Safety Test Procedures for Vented Appliances.

EGC 7.5 Integrated Pest Management (mandatory)

1. Seal all wall, floor and joint penetrations with low-VOC caulking or other appropriate nontoxic sealing method.
2. Install corrosion-proof metal pest screens for all openings greater than ¼ inch.
3. Seal off entry points under kitchen and bathroom sinks.

EGC 7.7 Ventilation

1. When replacing or installing new Bathroom Exhaust Fans, provide in full accordance with ASHRAE 62.2-2010 Energy Star-labeled dual-speed continuous bathroom fan, OR intermittent bathroom fans exhausted directly to outdoors, connected to a light switch, and equipped with a humidistat sensor, ventilation timer, occupancy sensor, delay off switch or ventilation control, minimum 50 cfm in each bathroom and provide product documentation.
2. Provide in full accordance with ASHRAE 62.2-2010 a whole-house mechanical ventilation system. Refer to HVAC drawings for ventilation strategy and required cfm of fresh air to each apartment unit. Local exhaust airflow may be credited toward the whole-house ventilation airflow requirement when local exhaust fans are used to provide whole-house mechanical ventilation.
3. In full accordance with ASHRAE 62.1-2010, install a mechanical ventilation system for all hallways and common spaces in Multifamily buildings.
4. All systems and associated ductwork must be installed per manufacturer's recommendations.
5. If using central ventilation systems with rooftop fans, each rooftop fan must be direct-drive and variable-speed with speed controller mounted near the fan. Fans with design CFM 300-2000 must also have an ECM motor.
6. Green Verifier/Energy Rater to conduct testing to verify ventilation system flow rates are within 15 CFM or 15% of the design value.
7. All systems and associated ductwork must be installed per manufacturer's recommendations.

EGC 7.12 Beyond ADA: Universal Design (mandatory)

Select one option below to implement. Implement three strategies in that option. For all selected strategies affecting dwelling units, implement that strategy for 75% of the project's dwelling units.

Option 1

1. Ensure high levels of even, natural, and artificial lighting within circulation and common areas.
2. Include universal, gender neutral restrooms available for use in common areas.
3. For shared interior or exterior spaces, include permanent essential amenities, including seating, toilets, and drinking water to promote comfort and use.

EGC 8.1 Building Maintenance Manual (mandatory)

1. General Contractor to provide Maintenance manual that addresses HVAC operations and maintenance, appliance guidance, lighting equipment, green cleaning products, and pest control. Refer to EGC 2020 criteria handbook for details.

EGC 8.2 Emergency Management Manual (mandatory)

1. General Contractor to provide Emergency Management Manual targeted toward operations and maintenance staff and other building level personnel. The manual should address responses to various types of emergencies, leading with those that have the greatest probability of negatively affecting the project. The manual should provide guidance as to how to sustain the delivery of adequate housing throughout an emergency and cover a range of topics including but not limited to:
   a. Communication plans for staff and residents to use in the event of an emergency.
   b. Useful contact information for public utility and other service providers
   c. Infrastructure and building "shutdown" procedures

EGC 8.4 Walk-throughs and Orientations to Property Operations (mandatory)

1. General Contractor to provide a comprehensive walk-through and orientation for property manager(s) and building operations staff within 90 days of initial occupancy. Use the appropriate manuals (8.1 & 8.2) as the base of the curriculum, and review the project's green features, operations and maintenance procedures, and emergency protocols.

ENCLOSURES

Multifamily

Renovation

1. Enterprise Green Communities Checklist
2. Energy Star National Rater Field Checklist

END OF SECTION 018113

2020 ENTERPRISE GREEN COMMUNITIES **CRITERIA CHECKLIST**

CRITERIA CHECKLIST

This checklist provides an overview of the technical requirements within the Enterprise Green Communities Criteria.

To achieve Enterprise Green Communities Certification, all projects must achieve compliance with the Criteria mandatory measures applicable to that construction type. **New Construction projects must also achieve at least 40 optional points, and Substantial and Moderate Rehab projects must also achieve at least 35 optional points.**

These projects that also comply with Criterion 5.2b or Criterion 5.4 will be recognized with Enterprise Green Communities Certification Plus.

Project:	St. Theresa Village
Address:	6783 Siebern Ave, Cincinnati, OH 45236
Location Type:	Urban/Suburban
Building Type:	Moderate Rehab

Yes	Maybe		1. INTEGRATIVE DESIGN
Yes		M	**1.1 Integrative Design: Project Priorities Survey** Complete the Project Priorities Survey, which can be found in the Appendix.
Yes		M	**1.2 Integrative Design: Charrettes and Coordination Meetings** Develop an integrative design process that moves the outputs of the Project Priorities Survey into action through a series of collaborative meetings. Prioritize multi-benefit strategies. Assign responsibility within your design and development teams for accountability.
Yes		M	**1.3 Integrative Design: Documentation** Include Enterprise Green Communities Criteria information in your contract documents and construction specifications (Division 1 Section 01 81 13 Sustainable Design Requirements) as necessary for the construction team to understand the requirements and how they will be verified. Ensure, and indicate, that the drawings and specifications have been generated to be compliant and meet the certification goals.
Yes		M	**1.4 Integrative Design: Construction Management** Create, implement, and document your contractor/subcontractor education plan to ensure that all persons working on-site fully understand their role in achieving the project objectives. Include a summary of the Project Priorities Survey (Criterion 1.1), the sustainability goals, and anticipated roles of each party in regards to the performance expected of the project. Attach and reference this training plan to Division 1 Section 01 81 13 Sustainable Design Requirements. Include timeline estimates for performance testing and verification schedules in the overall construction schedule. As relevant, review requirements for Criteria 8.1, 8.2, and 8.3, and begin populating these documents with relevant information from design and construction.

		12 or 15	**1.5 Design for Health and Well-Being: Health Action Plan** Follow Steps 1-6 of the Health Action Plan framework per the full criterion. *[12 points with extra 3 points for Step 7]* This includes: 1) Commit to embedding health into the project lifecycle; 2) Partner with a project health professional; 3) Collect and analyze community health data; 4) Engage with community stakeholders to prioritize health data and strategies; 5) Identify strategies to address those health issues; 6) Create an implementation plan; and 7) Create a monitoring plan.
		10	**1.6 Resilient Communities: Multi-Hazard Risk/Vulnerability Assessment** Conduct a four-part assessment (social, physical, functional, strategy) to identify critical risk factors of your property and implement at least two sets of strategies to enable the project to adapt to, and mitigate, climate related or seismic risks. See full criterion for more guidance.
		8	**1.7 Resilient Communities: Strengthening Cultural Resilience** Integrate community and resident participation in the development processes so that the built environment honors cultural identities, resident voices, and community histories. Option 1: Complete a Cultural Resilience Assessment OR Option 2: Convene a Cultural Advisory Group
0	0		1. INTEGRATIVE DESIGN SUBTOTAL
Yes	Maybe		**2. LOCATION + NEIGHBORHOOD FABRIC**
Yes		M	**2.1 Sensitive Site Protection** All projects must: 1. Protect floodplain functions (e.g., storage, habitat, water quality) by limiting new development within the 100-year floodplain of all types of watercourses. 2. Conserve and protect aquatic ecosystems, including wetlands and deepwater habitats, that provide critical ecosystem functions for fish, other wildlife, and people. 3. Protect ecosystem function by avoiding the development of areas that contain habitat for plant and animal species identified as threatened or endangered. 4. Conserve the most productive agricultural soils by protecting prime farmland, unique farmland, and farmland of statewide or local importance. If your site contains any of these ecologically sensitive features, follow the specific Requirements under that subheading.
N/A		M	**2.2 Connections to Existing Development and Infrastructure** *(Mandatory for New Construction projects that do not qualify as Rural/Tribal/Small Town)* Locate the project on a site with access to existing roads, water, sewers, and other infrastructure and within or contiguous to (having at least 25% of the perimeter bordering) existing development. Connect the project to the existing pedestrian network. For sites over 5 acres, provide connections to the adjacent street network at least every 800 feet. Tie all planned bike paths to existing bike paths.

N/A		M	**2.3 Compact Development** *(Mandatory for New Construction)* At a minimum, build to the residential density (dwelling units/acre) of the census block group where the project is located. In Rural/Tribal/Small Town locations that do not have zoning requirements: Build to a minimum net density of 5 units per acre for single-family houses; 10 units per acre for multifamily buildings, single and two-story; and 15 units per acre for multifamily buildings greater than two-stories.
7		5 or 7	**2.4 Increased Compact Development** Exceed the residential density (dwelling units/acre) of the census block group in which your project is located. Exceed by 2x for *[5 points]* ; exceed by 3x for *[7 points]* . In Rural/Tribal/Small Towns that do not have zoning requirements, build to a minimum net density of 7.5 units per acre for single-family houses; 12 units per acre for multifamily buildings, single and two-story; and 20 units per acre for multifamily buildings greater than two stories. *[5 points]*
N/A		M	**2.5 Proximity to Services and Community Resources** *(Mandatory for New Construction)* Locate the project within a 0.5-mile walk distance of at least four, or a 1-mile walk distance of at least seven, of the listed services. For projects that qualify as Rural/Tribal/Small Town, locate the project within 5 miles of at least four of the listed services.
N/A		M	**2.6 Preservation of and Access to Open Space for Rural/Tribal/Small Town** *(Mandatory for New Construction Rural/Tribal/Small Town)* Option 1: Locate the project within a 0.25-mile walk distance of dedicated public open space that is a minimum of 0.75 acres; at least 80% of which unpaved. OR Option 2: Set aside a minimum of 10% (minimum of 0.25 acres) of the total project acreage as open and accessible to all residents; at least 80% of which unpaved.
		6 max	**2.7 Preservation of and Access to Open Space** Option 1: Locate the project within a 0.25-mile walk distance of dedicated open space that is a minimum of 0.75 acres; at least 80% of which unpaved. *[4 points]* OR Option 2: Set aside a percentage of permanent open space for use by all residents; at least 80% of which unpaved. 25% *[2 points] ;* 35% *[4 points] ;* 45% + written statement of preservation/ conservation policy *[6 points].*

N/A		M	**2.8 Access to Transit** *(Mandatory for New Construction projects that do not qualify as Rural/Tribal/Small Town; Optional for all other project types)* **Mandatory: New Construction, not Rural/Tribal/Small Town** Locate projects within a 0.5-mile walk distance of transit services (bus, rail and/or ferry), constituting at least 45 or more transit rides per weekday, with some type of weekend service.
		2	**Optional: New Construction, not Rural/Tribal/Small Town** Locate the project along dedicated bike trails or lanes (Class I, II, or IV) that lead to high-quality transit services (100 trips per day) within 3 miles. *[2 points]*
6		2, 6, 8	**Optional: Rehabilitation, not Rural/Tribal/Small Town** Locate projects within a 0.5-mile walk distance of public transit services (bus, rail and/or ferry), constituting at least 45 or more transit rides per weekday, with some type of weekend service. [6 points] Locate the project along dedicated bike trails or lanes (Class I, II, or IV) that lead to high-quality transit services (100 trips per day) within 3 miles. *[2 points]*
		6	**Optional: New Construction and Rehabilitation, Rural/Tribal/Small Town** Locate the project within 0.5 mile walk distance of public transit services with at least 45 rides per weekday and some weekend service. OR, Install at least two charging stations for electric vehicles. OR, Locate the project with 5 miles of one of the following transit options: 1) vehicle share program; 2) dial-a-ride program; 3) employer vanpool; 4) park-and-ride; 5) public/private regional transportation.
		2-8	**2.9 Improving Connectivity to the Community** Improve access to community amenities through at least one of the options incentivizing biking mobility or improving access to transit.
		5 max	**2.10 Passive Solar Heating/Cooling** Design and build with passive solar design, orientation, and shading that meet the guidelines specified.
		6	**2.11 Adaptive Reuse of Buildings** Rehabilitate and adapt an existing structure that was not previously used as housing. Design the project to adapt, renovate, or reuse at least 50% of the existing structure and envelope.
		6	**2.12 Access to Fresh, Local Foods** Provide residents and staff with access to fresh, local foods through one of the following options: Option 1: Neighborhood Farms and Gardens Option 2: Community-Supported Agriculture Option 3: Proximity to Farmers Market
		8	**2.13 Advanced Certification: Site Planning, Design and Management** Locate building(s) within a community that is certified in LEED for Neighborhood Development, LEED for Cities and Communities, Living Community Challenge, or SITES.

	3	6 max	**2.14 Local Economic Development and Community Wealth Creation** Demonstrate that local preference for construction employment and subcontractor hiring was part of your bidding process, and how it functioned during construction. *[2 points]* OR Demonstrate that you achieved at least 20% local employment. *[3 points]* OR Provide physical space for small business, nonprofits, and/or skills and workforce education. *[3 points]*
N/A		M	**2.15a Access to Broadband: Broadband Ready** *(Mandatory for New Construction and Substantial Rehab Projects in Rural/Tribal/Small Town Locations)* Incorporate broadband infrastructure so that when broadband service comes to a community, the property can be easily connected. Include a network of mini-ducts or conduit throughout the building, extending from the expected communications access point to each network termination point in the building.
	6	6	**2.15b Access to Broadband: Connectivity** Ensure all units and common spaces in the property have broadband internet access with at least a speed of 25/3 mbs.
13	**9**		**2. LOCATION + NEIGHBORHOOD FABRIC SUBTOTAL**
Yes	**Maybe**		**3. SITE IMPROVEMENT**
Yes		M	**3.1 Environmental Remediation** Determine whether there are any hazardous materials present on the site through one of the four methods listed. Mitigate any contaminants found.
Yes		M	**3.2 Minimization of Disturbance during Staging and Construction** For sites >1 acre, implement EPA's National Pollutant Discharge Elimination System Stormwater Discharges from Construction Activities guidance, or local requirements, whichever is more stringent. For sites with an area <= 1, follow guidance in full criterion.
Yes		M	**3.3 Ecosystem Services/Landscape** *(Mandatory, if providing landscaping)* If providing plantings, all must be native or climate-appropriate (adapted) to the region and appropriate to the site's soil and microclimate. Do not introduce any invasive plant species. Plant, seed, or xeriscape all disturbed areas.
N/A		M	**3.4 Surface Stormwater Management** *(Mandatory for New Construction; Mandatory for Substantial and Moderate Rehab projects if land disturbed is >= 5,000 sq.ft.)* Treat or retain on-site precipitation equivalent to the 60th percentile precipitation event. Where not feasible due to geotechnical issues, soil conditions, or the size of the site, treat or retain the maximum volume possible.

		10 max	**3.5 Surface Stormwater Management** Through on-site infiltration, evapotranspiration, and rainwater harvesting, retain precipitation volume from 70% precipitation event *[6 points],* 80% precipitation event *[8 points]* , or 90% precipitation event *[10 points].*
N/A		M	**3.6 Efficient Irrigation and Water Reuse** *(Mandatory, if permanent irrigation is utilized)* If irrigation is utilized, install an efficient irrigation system per the requirements listed.
		4 or 6	**3.7 Efficient Irrigation and Water Reuse** *(Optional, if irrigation is utilized)* Meet the requirements of Criterion 3.6 AND: Option 1: Install an efficient irrigation system equipped with a WaterSense labeled weather- based irrigation controller (WBIC) OR Option 2: At least 50% of the site's irrigation satisfied by water use from the sources listed.
0	0		3. SITE IMPROVEMENT SUBTOTAL
Yes	Maybe		**4. WATER**
Yes		M	**4.1 Water-Conserving Fixtures** Reduce total indoor water consumption by at least 20% compared to baseline indoor water consumption chart. Any new toilet, showerhead, and/or lavatory faucet must be WaterSense certified. For all single-family homes and all dwelling units in buildings three stories or fewer, the supply pressure may not exceed 60 psi.
3		6 max	**4.2 Advanced Water Conservation** Reduce total indoor water consumption by at least 30% compared to baseline indoor water consumption chart. Any new toilet, showerhead, and/or lavatory faucet must be WaterSense certified.
Yes			**4.3 Water Quality**
		M, 3	**Mandatory/Optional:** Mandatory for Substantial Rehabs of buildings built before 1986; Optional for all other building types: Replace lead service lines *[3 points]*
		M	**Mandatory:** For multifamily buildings with either a cooling tower, a centralized hot water system, or 10+ stories: Develop a Legionella water management program
		8	**Optional:** Test and remediate as indicated for lead, nitrates, arsenic, and coliform bacteria

		4	**4.4 Monitoring Water Consumption and Leaks** Conduct pressure-loss tests and visual inspections to determine if there are leaks; fix leaks. AND Install an advanced water monitoring and leak detection system capable of identifying and shutting water off during anomalous water events. OR Install a device to separately monitor water consumption of each cold branch off the apartment line riser for each dwelling unit or each cold water riser and the domestic hot water cold water feed for each building or each toilet that allows remote monitor readings; common laundry facilities; boiler makeup water; outdoor water consumption; and water consumption in any non-residential space.
		4	**4.5 Efficient Plumbing Layout and Design** Store no more than 0.5 gallon of water in any piping/manifold between the fixture and the water heating source or recirculation line. No more than 0.6 gallon of water shall be collected from the fixture before a 10-degree Fahrenheit rise in temperature is observed. Recirculation systems must be demand-initiated.
		6 max	**4.6 Non-Potable Water Reuse** Harvest, treat, and reuse rainwater and/or greywater to meet a portion of the project's non-potable water needs: 10% reuse *[3 points]* ; 20% reuse *[4 points]* ; 30% reuse *[5 points];* 40% reuse *[6 points].*
		8	**4.7 Access to Potable Water During Emergencies** Provide residents with ready access to potable water in the event of an emergency that disrupts normal access to potable water, including disruptions related to power outages that prevent pumping water to upper floors of multifamily buildings or pumping of water from on-site wells, per one of the three options listed.
3	0		4. WATER SUBTOTAL
Yes	Maybe		**5. OPERATING ENERGY**
N/A		M	**5.1a Building Performance Standard** *(Mandatory for New Construction)* Certify all buildings with residential units in the project through either ENERGY STAR Multifamily New Construction, ENERGY STAR Manufactured Homes, and/or ENERGY STAR Certified Homes as relevant. AND Provide projected operating energy use intensity and projected operating building emissions intensity.

Yes		M	**5.1b Building Performance Standard** *(Mandatory for Rehab)* Provide projected operating energy use intensity and projected operating building emissions intensity. AND Conduct commissioning for compartmentalization, insulation installation, and HVAC systems as indicated. AND one of the following options: - ERI Option: <= HERS 80 for each dwelling unit. Exception for some Rehabs built before 1980. - ASHRAE Option: Energy performance of the completed building equivalent to, or better than, ASHRAE 90.1-2013 using an energy model created by a qualified energy services provider according to Appendix G 90.1-2016.
		12 max	**5.2a Moving to Zero Energy: Additional Reductions in Energy Use** *(Not available for projects using prescriptive path for Criterion 5.1a or for projects following Criterion 5.2b or 5.4.)* Projects in CZ 1-4A following this criterion must also comply with Criterion 7.8. Design and construct a building that is projected to be more efficient than what is required by Criteria 5.1a/b. Achieve HERS score of 5 lower than required by 5.1a/b if following ERI path for compliance OR 5% greater efficiency than required if following ASHRAE path for 5.1a/b compliance *[5 points].* Additional 1 point for each additional 2-point decrease in HERS score required by Criteria 5.1a/b if following ERI path for compliance OR for 1% greater efficiency if following ASHRAE path for Criteria 5.1a/b, up to a maximum of 12 optional points.
		12-15	**5.2b Moving to Zero Energy: Near Zero Certification** **[Mandatory for Enterprise Green Communities Certification Plus]** *(Not available for projects following Criterion 5.2a or 5.4.)* Projects in CZ 1-4A following this criterion must also comply with Criterion 7.8. Certify the project in a program that requires advanced levels of building envelope performance such as DOE ZERH *[12 points]* and/or PHI Classic or PHIUS+ *[15 points]* .
		3-6	**5.3a Moving to Zero Energy: Photovoltaic/Solar Hot Water Ready** *(Not available for projects following Criterion 5.3b or 5.4.)* Orient, design, engineer, wire, and/or plumb the development through the Photovoltaic Ready pathway or Solar Hot Water Ready Pathway to accommodate installation of photovoltaic (PV) or solar hot water system in the future.
		8 max	**5.3b Moving to Zero Energy: Renewable Energy** *(Not available for projects following Criterion 5.3a or 5.4)* Install renewable energy source to provide a specified percentage of the project's estimated source energy demand. See full criterion for allowable sources.
		4-8	**Option 1:** For percentage of total project energy consumption provided by renewable energy. OR
		1-5	**Option 2:** For percentage of common area meter energy consumption provided by renewable energy.

		24	**5.4 Achieving Zero Energy** **[Automatic Qualification for Enterprise Green Communities Certification Plus]** *(Not available for projects following Criterion 5.2a, 5.2b, 5.3a, or 5.3b.)* Projects in CZ 1-4A following this criterion must also comply with Criterion 7.8. Achieve Zero Energy performance through one of the following options: **Option 1:** Certify each building in the project to DOE Zero Energy Ready Home program or PHI Plus AND Either install renewables and/or procure renewable energy, which in sum will produce as much, or more, energy in a given year than the project is modeled to consume. OR **Option 2:** Certify each building in the project in a program that requires zero energy performance such as PHIUS+ Source Zero, PHI Plus, PHI Premium, ILFI's Zero Energy Petal, Zero Carbon Petal, or Living Building Certification.
		5 max	**5.5a Moving to Zero Carbon: All-Electric Ready** *(Not available for projects following Criterion 5.5b)* Ensure the project has adequate electric service and has been designed and wired to allow for a seamless switch to electricity as a fuel source in the future for the following uses: space heating *[1 point],* space cooling *[1 point]* , water heating (DHW) *[1 point]* , clothes dryers *[1 point]* , equipment for cooking *[1 point].*
		15	**5.5b Moving to Zero Carbon: All Electric** *(Not available for projects following Criterion 5.5a)* No combustion equipment used as part of the building project; the project is all-electric.
Yes		M	**5.6 Sizing of Heating and Cooling Equipment** *(Mandatory for Substantial and Moderate Rehabs that include replacement of heating and cooling equipment. Not relevant for projects following 5.1a, 5.2b, or 5.4.)* Size and select heating and cooling equipment in accordance with ACCA manuals J and S OR in accordance with the ASHRAE Handbook of Fundamentals
Yes		M	**5.7 ENERGY STAR Appliances** *(Mandatory for Substantial and Moderate Rehabs providing appliances. Not relevant for projects following 5.1a, 5.2b, or 5.4.)* Install ENERGY STAR clothes washers, dishwashers, and refrigerators. If appliances will not be installed or replaced at this time, specify that at the time of installation or replacement, ENERGY STAR models must be used via Criterion 8.1 and Criterion 8.4.
Yes		M	**5.8 Lighting** *(Mandatory for all lighting within New Construction and Substantial Rehab projects. Mandatory for new lighting in Moderate Rehab projects.)* Follow the guidance for high-efficacy permanently installed lighting and other characteristics for recessed light fixtures, lighting controls, lighting power density, and exterior lighting.

		8	**5.9 Resilient Energy Systems: Floodproofing** *(Not relevant for Rehab projects in Special Flood Hazard Areas)* Conduct floodproofing of lower floors, including perimeter floodproofing (barriers/shields). Design and install building systems as specified by the full criterion so that the operation of those systems will not be grossly affected in case of a flood.
		8	**5.10 Resilient Energy Systems: Critical Loads** Loads Provide emergency power to serve at least three critical energy loads as described by the full criterion. **Option 1**: Islandable PV system OR **Option 2**: Efficient generator
0	0		5. OPERATING ENERGY SUBTOTAL
Yes	Maybe		**6. MATERIALS**
		8 max	**6.1 Ingredient Transparency for Material Health** Install products that have publicly disclosed inventories characterized and screened to 1,000 ppm or better: • 1 point per 5 installed Declare or HPD products from at least three different product categories • 1 point per 2 installed Declare or HPD products in any of these categories: adhesives, sealants, windows • 1 point per each product with third-party verified HPD or third-party verified Declare label • 2 points per each product with third-party verified HPD or third-party verified Declare label in any of these categories: adhesives, sealants, windows
		3 max	**6.2 Recycled Content and Ingredient Transparency** Use building products that feature, and disclose, their recycled content. The building product must make up 75% by weight or cost of a project category for the project and be composed of at least 25% post-consumer recycled content.
		8 max	**6.3 Chemical Hazard Optimization** Install products that have third-party verification of optimization to 100 ppm or better per the options listed within the full criterion.
Yes 3		M 15 max	**6.4 Healthier Material Selection** Select all interior paints, coatings, primers, and wallpaper; interior adhesives and sealants; flooring; insulation; and composite wood as specified. Optional points also available.
		12 max	**6.5 Environmentally Responsible Material Selection** Select concrete, steel, or insulation with a publicly disclosed EPD *[3 points]* , Install a green or cool roof *[3 points]* , use reflective paving *[3 points]* , and/or use FSC certified wood *[3 points]* . Refer to criterion for specifics.

Yes		M	**6.6 Bath, Kitchen, Laundry Surfaces** *(Mandatory for New Construction and Substantial Rehab. Moderate Rehabs that do not include work in the shower and tub areas are exempt from the shower and tub enclosure requirement.)* Use materials that have durable, cleanable surfaces throughout bathrooms, kitchens, and laundry rooms. Use moisture-resistant backing materials per ASTM # D 6329 or 3273 behind tub/shower enclosures, apart from one-piece fiberglass enclosures which are exempt.
		4 max	**6.7 Regional Materials** Use products that were extracted, processed, and manufactured within 500 miles of the project for a minimum of 90%, based on weight or on cost, of the amount of the product category installed. Select any or all of these options (every two compliant materials can qualify for 1 point): • Framing Cladding (e.g. siding, masonry, roofing) • Flooring Concrete/cement and aggregate • Drywall/interior sheathing
N/A		M	**6.8 Managing Moisture: Foundations** *(Mandatory for all New Construction projects and all Rehab projects with either basement and/or crawl space foundations)* Install capillary breaks and vapor retarders that meet specified criteria appropriate for the foundation type.
Yes		M	**6.9 Managing Moisture: Roofing and Wall Systems** *(Mandatory for all Rehab projects that include deficiencies in or include replacing particular assemblies called out below. New Construction projects are considered compliant per Criterion 5.1.)* Provide water drainage away from walls, window, and roofs by implementing the list of techniques.
Yes		M	**6.10 Construction Waste Management**
		6 max	Develop and implement a waste management plan that reduces non-hazardous construction and demolition waste through recycling, salvaging, or diversion strategies through one of the three options. Achieve optional points by going above and beyond the requirement.
		2	**6.11 Recycling Storage** For projects with municipal recycling infrastructure and/or haulers, provide separate bins for the collection of trash and recycling for each dwelling unit and all shared community rooms. OR For projects without that infrastructure, advocate to the local waste hauler or municipality for regular collection of recyclables.
3	0		6. MATERIALS SUBTOTAL

Yes	Maybe		7. HEALTHY LIVING ENVIRONMENT
N/A		M	**7.1 Radon Mitigation** *(Mandatory for New Construction and Substantial Rehab)* For New Construction in EPA Zone 1 areas, install passive radon-resistant features below the slab and a vertical vent pipe with junction box within 10 feet of an electrical outlet in case an active system should prove necessary in the future. For Substantial Rehab projects in EPA Zone 1, test before and after the retrofit and mitigate per the specified protocols.
N/A		M	**7.2 Reduce Lead Hazards in Pre-1978 Buildings** *(Mandatory for Substantial Rehab of Buildings Constructed Before 1978)* Conduct lead risk assessment or inspection to identify lead hazards. Control identified lead hazards using lead abatement or interim controls, using lead-safe work practices that minimize and contain dust.
Yes		M	**7.3 Combustion Equipment** **For New Construction and Rehab projects:** Specify power-vented or direct-vent equipment when installing any new combustion appliance for space or water heating that will be located within the conditioned space. If there are any combustion appliances within the conditioned space, install one hard-wired carbon monoxide (CO) alarm with battery backup function for each sleeping zone, placed per National Fire Protection Association (NFPA) 72. **For Rehabs:** If there is any combustion equipment located within the conditioned space for space or water heating that is not power-vented or direct-vent and that is not scheduled for replacement, conduct combustion safety testing prior to and after the retrofit; remediate as indicated.
N/A		M	**7.4 Garage Isolation** • Provide a continuous air barrier between the conditioned space and any garage space to prevent the migration of any contaminants into the living space. Visually inspect common walls and ceilings between attached garages and living spaces to ensure that they are air-sealed before insulation is installed. • Do not install ductwork or air handling equipment for the conditioned space in a garage. • Fix all connecting doors between conditioned space and garage with gaskets or make airtight. • Install one hard-wired CO alarm with battery backup function for each sleeping zone of the project, placed per NFPA 72 unless the garage is mechanically ventilated or an open parking structure.
Yes		M	**7.5 Integrated Pest Management** Seal all wall, floor, and joint penetrations with low-VOC caulking or other appropriate nontoxic sealing methods to prevent pest entry.
Yes		M	**7.6 Smoke-Free Policy** **Mandatory:** Implement and enforce a smoke-free policy in all common areas and within a 25-foot perimeter around the exterior of all residential buildings. Lease language must prohibit smoking in these locations and provide a graduated enforcement policy. Make the smoke-free policy readily available.
10		10	**Optional:** Expand the policy above to include all indoor spaces in the property.

6		M 12 max	**7.7 Ventilation** *(Mandatory for New Construction and Substantial Rehab; Optional for Moderate Rehab)* For each dwelling unit in full accordance with ASHRAE 62.2-2010, install: • A local mechanical exhaust system in each bathroom *[3 points if Moderate Rehab]* • A local mechanical exhaust system in each kitchen *[3 points if Moderate Rehab]* • A whole-house mechanical ventilation system *[3 points if Moderate Rehab]* Verify these flow rates are either within +/- 15 CFM or +/- 15% of design value. For each multifamily building of four or more stories, in full accordance with ASHRAE¬†62.1-2010, install: • A mechanical ventilation system for all hallways and common spaces *[3 points if Moderate Rehab]* For all project types, in addition to the above requirements: • All systems and ductwork must be installed per manufacturer's recommendations • All bathroom fans must be ENERGY STAR-labeled and wired for adequate run-time. • If using central ventilation systems with rooftop fans, each fan must be direct-drive and variable-speed with speed controller mounted near the fan. Fans with design CFM 300-2000 must also have an ECM motor.
N/A		M , 5	**7.8 Dehumidification** *(Mandatory for properties in Climate Zones 1A, 2A, 3A, and 4A following Criterion 5.2a, 5.2b, or 5.4. Optional for all other properties.)* **Option 1:** Design, select, and install supplemental dehumidification equipment to keep relative humidity OR **Option 2**: Equip all dwelling units with dedicated space, drain, and electrical hook-ups for permanent supplemental dehumidification systems to be installed if needed and install interior RH monitoring equipment as described.
		3	**7.9 Construction Pollution Management** **Option 1:** Earn the EPA Indoor airPlus label OR **Option 2:** In all dwelling units, seal all heating, cooling, and ventilation return and supply floor ducts and returns throughout construction to prevent construction debris from entering. Flush all dwelling units after completion of construction and prior to occupancy for either 48 hours or with at least 14,000 ft3 per ft2 of floor area, then replace all air handling equipment filters.
		3	**7.10 Noise Reduction** **Option 1:** Test and demonstrate that noise levels in bedrooms meet 30 dB LAeq (continuous) and 45 dB LAmax, (single sound). OR **Option 2:** Provide a noise abatement plan specific to the site covering general noise mitigation techniques in accordance with 24 CFR 51B. OR Option 3: Ensure all exterior wall and party wall penetrations are sealed with acoustical sealant, all party walls and floor/ceiling assemblies have an STC rating of at least 55, and exterior windows and doors in projects near a significant exterior noise source have an STC rating of at least 35

8		8	**7.11 Active Design: Promoting Physical Activity** *(All projects must comply with at least one of either Criterion 7.11, 7.12, or 7.13. Points are not available for that criterion, but, are available for projects that meet two or three of these criteria.)* **Option 1:** Encouraging Everyday Stair Usage (buildings that include stairs as the only means to travel from one floor to another are not eligible for this option.) Provide a staircase that is accessible and visible from the main lobby and is visible within a 25-foot walking distance from any point in the lobby per the specifications listed. Place point-of-decision signage. OR **Option 2:** Activity Spaces. Provide on-site dedicated recreation space with exercise or play opportunities for adults and/or children that is open and accessible to all residents; see criterion for specifics.
Yes		8	**7.12 Beyond ADA: Universal Design** *(All projects must comply with at least one of either Criterion 7.11, 7.12, or 7.13. Points are not available for that criterion, but, are available for projects that meet two or three of these criteria.)* Select and implement at least one of the Options with at least three different strategies in at least 75% units. **Option 1:** Create welcoming and accessible spaces that encourage equitable use and social connections. **Option 2:** Create spaces that are easy and intuitive to use and navigate. **Option 3:** Promote safety and create spaces that allow for human error. **Option 4:** Create spaces that can be accessed and used with minimal physical effort. **Option 5:** Create spaces with the appropriate size and space to allow for use, whatever the user's form of mobility, size, or posture.
		8	**7.13 Healing-Centered Design** *(All projects must comply with at least one of either Criterion 7.11, 7.12, or 7.13. Points are not available for that criterion, but, are available for projects that meet two or three of these criteria.)* Select and implement at least two of the Options with at least two different strategies listed in at least 75% units. **Option 1:** Provide an environment that promotes feelings of real and perceived safety. **Option 2:** Create flexible spaces that allow for personalization and/or manipulation to meet individual and community needs. **Option 3:** Connect residents and staff to a living landscape and the natural environment. **Option 4:** Utilize art and culture in project design and programming and promote social connectedness.
24	0		**7. HEALTHY LIVING ENVIRONMENT SUBTOTAL**
Yes	**Maybe**		**8. OPERATIONS, MAINTENANCE + RESIDENT ENGAGEMENT**
Yes		M	**8.1 Building Operations & Maintenance Manual and Plan** *(For all Multifamily projects)* Develop a manual with thorough building operations and maintenance (O&M) guidance and a complementary plan. The manual and plan should be developed over the course of the project design, development, and construction stages, and should include sections/chapters addressing the list of topics.

Yes		M	**8.2 Emergency Management Manual** *(For all Multifamily projects)* Provide a manual on emergency operations targeted toward operations and maintenance staff and other building-level personnel. The manual should address responses to various types of emergencies, leading with those that have the greatest probability of negatively affecting the project. The manual should provide guidance as to how to sustain the delivery of adequate housing throughout an emergency and cover a range of topics, including but not limited to: • communication plans for staff and residents • useful contact information for public utility and other service providers • infrastructure and building, "shutdown" procedures • plan for regular testing of backup energy systems, if these exist
Yes		M	**8.3 Resident Manual** Provide a guide for homeowners and renters that explains the intent, benefits, use, and maintenance of their home's green features and practices. The Resident Manual should encourage green and healthy activities per the list of topics.
Yes		M	**8.4 Walk-Throughs and Orientations to Property Operation** Provide a comprehensive walk-through and orientation for all residents, property manager(s), and buildings operations staff.
Yes		M	**8.5 Energy and Water Data Collection and Monitoring** For rental properties, upload project energy and water performance data in an online utility benchmarking platform annually for at least five years from time of construction completion per one of the four methods provided; grant Enterprise view access for that period. For owner-occupied units, collect and monitor utility data in a manner that allows for easy access and review.
0	0		**8. OPERATIONS, MAINTENANCE + RESIDENT ENGAGEMENT SUBTOTAL**
43	**9**		**TOTAL**

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Building Name: _____ Number of Units: _____ Permit Date: _____

Building Address: _____ City: _____ State: _____

Thermal Enclosure System **1. High-Performance Insulation & Fenestration**	**Must Correct**	**Builder Verified [3]**	**Rater Verified [4]**	**N/A [5]**
1.1 Insulation meets specifications in National Rater Design Review Checklist Item 2.1.	☐	Pre-rock+20 ☐	☐	-
1.2 All insulation achieves Grade I install. per ANSI / RESNET / ICC 301. Alternatives in Footnote 6. [7]	☐	Pre-rock+20 ☐	☐	-
1.3 Fenestration meets specifications in National Rater Design Review Checklist Items 2.1 & 2.2.	☐	-	☐	-
1.4 Prescriptive Path: Window-to-wall ratio ≤ 30%. [8]	☐	-	☐	☐
1.5 For mass or metal-framed above-grade walls (including floor perimeter edges), continuous rigid insulation, insulated siding, or combination of the two is: ≥ R-3 in CZ 1-4; ≥ R-5 in CZ 5-8. [9, 10,11, 12, 13, 14]	☐	≤ 20 sq. ft. ☐	☐	☐
1.6 For concrete slab floors in CZ 4-8 above ambient conditions, heated or unheated garages, or unconditioned spaces outside the thermal boundary, floor insulation meets the U-factor specified in Table 502.1.2 of the 2009 IECC for Group R when dwelling units are above the slab, & 'All Other' when common space is above the slab. Alternative in Fn. 15. [9, 16]	☐	≤ 20 sq. ft. ☐	☐	☐
1.7 Heated plenums in unconditioned space or ambient conditions must meet the following requirements: [17]				
1.7.1 Sides of heated plenum are an air barrier and insulated to ≥ R-3ci in CZ 1-4; ≥ R-5ci in CZ 5-6; ≥ R-7.5ci in CZ 7; ≥ R-9.5ci in CZ 8, [9] **AND;**	☐	≤ 20 sq. ft. ☐	☐	☐
1.7.2 Insulation at top of heated plenum meets Item 1.6 where applicable. Otherwise, meets or exceeds the R-value for mass floors from the "All Other" column of Table 502.2(1) of 2009 IECC, [9, 18] **AND;**	☐	≤ 20 sq. ft. ☐	☐	☐
1.7.3 Bottom of heated plenum must have at least R-13 insulation. [18, 19]	☐	≤ 20 sq. ft. ☐	☐	☐
1.8 Garages with space heating must meet the following requirements: [17]				
1.8.1 Insulation on above grade walls and walls on the first story below grade ≥ R-5ci in CZ 5-6; ≥ R-7.5ci in CZ 7; ≥ R-9.5ci in CZ 8, [9] **AND;**	☐	≤ 20 sq. ft. ☐	☐	☐
1.8.2 Ceiling insulation meets Item 1.6 where applicable. Otherwise, meets or exceeds the R-value for mass floors from the "All Other" column of Table 502.2(1) of 2009 IECC. [9]	☐	≤ 20 sq. ft. ☐	☐	☐
2. Fully-Aligned Air Barriers [20] At each insulated location below, a complete air barrier is provided that is fully aligned as follows:				
Ceilings: At interior or exterior horizontal surface of ceiling insulation in Climate Zones 1-3; at interior horizontal surface of ceiling insulation in Climate Zones 4-8. Also, at exterior vertical surface of ceiling insulation in all climate zones (e.g., using a wind baffle that extends to the full height of the insulation in every bay or a tabbed baffle in each bay with a soffit vent that prevents wind washing in adjacent bays). [9, 21]				
2.1 Dropped ceilings / soffits below unconditioned attics, chase / dead space, and all other ceilings.	☐	≤ 20 sq. ft. ☐	☐	☐
Walls: At exterior vertical surface of wall insulation in all climate zones; also at interior vertical surface of wall insulation in Climate Zones 4-8. [9, 22]				
2.2 Walls behind showers, tubs, staircases, and fireplaces.	☐	≤ 20 sq. ft. ☐	☐	☐
2.3 Architectural bump-outs, dead space, and all other exterior walls.	☐	≤ 20 sq. ft. ☐	☐	-
Floors: At exterior vertical surface of floor insulation in all climate zones and, if over unconditioned space, also at interior horizontal surface including supports to ensure alignment. Alternatives in Footnotes 22 & 23. [23, 24, 25]				
2.4 Floors above garages, floors above unconditioned spaces, and cantilevered floors.	☐	≤ 20 sq. ft. ☐	☐	☐
2.5 All other floors adjoining unconditioned space (e.g., rim / band joists at exterior wall or at porch roof).	☐	≤ 20 sq. ft. ☐	☐	☐
3. Reduced Thermal Bridging – Reduced thermal bridging strategies are not mandatory. However, the following details must be accurately assessed per ANSI / RESNET / ICC 301 and Footnote 28. [26]				
3.1 Insulated ceilings assessed at the attic edge for variance in R-value and install quality.	☐	-	☐	☐
3.2 Insulation assessed beneath attic platforms and walkways for variance in R-value.	☐	-	☐	☐
3.3 Attic access panels and drop-down stairs assessed for insulated covers.	☐	-	☐	☐
3.4 Wood-framed above-grade walls separating conditioned from unconditioned space assessed for advanced framing.	☐	-	☐	☐
3.5 Above-grade and at-grade concrete floor edges (e.g., podiums, balconies, projected slabs) assessed for a complete thermal break per Footnote 28 and, in CZ 4-8, total building UA documented in the Multifamily Workbook.[9, 27, 28, 29]	☐	-	☐	☐
3.6 Slabs on grade assessed for insulation where walls separate conditioned from unconditioned space. [30]	☐	-	☐	☐
4. Air Sealing	**Must Correct**	**Builder Verified [3]**	**Rater Verified [4]**	**N/A [5]**
Rater has verified each air sealing detail below. Unless otherwise specified, items apply to assemblies in dwelling units and common spaces where adjacent to the exterior, other buildings, or unconditioned spaces. "Sealed" indicates the use of caulk, foam, or equivalent material.				
4.1 Ducts, flues, shafts, plumbing, piping, wiring, exhaust fans, & other penetrations are sealed, with blocking / flashing as needed.	☐	≤ 2 penetrations ☐	☐	-
4.2 Attic access panels, roof hatches and drop-down stairs are gasketed, (i.e., not caulked) or equipped with covers that are gasketed.	☐	-	☐	☐

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4. Air Sealing (cont.)	Must Correct	Builder Verified [3]	Rater Verified [4]	N/A [5]
4.3 Recessed lighting fixtures are ICAT labeled and gasketed.	☐	No limit ☐	☐	☐
4.4 Drywall is sealed to top plate during installation, or from the attic side at all unconditioned attic / wall interfaces. Drywall adhesive (but not other construction adhesives), is permitted to be used.	☐	No limit ☐	☐	☐
4.5 Rough opening around windows & exterior doors is sealed.	☐	-	☐	-
4.6 Assemblies that separate attached garages from occupiable space are sealed. In addition, an air barrier is installed, sealed, and aligned with these assemblies. [31]	☐	-	☐	☐
4.7 Doors adjacent to unconditioned space (e.g., attics, garages, basements) or ambient conditions are made substantially air-tight with door seal and weatherstripping or equivalent gasket.	☐	-	☐	☐
The following items must be additionally verified in dwelling units, to reduce air leakage between conditioned spaces.				
4.8 Doors serving as a unit entrance from a corridor/stairwell made substantially air-tight with door seal and weatherstripping or equivalent gasket.	☐	-	☐	☐
4.9 Rater-measured air leakage meets the following CFM50 per sq. ft. of Dwelling Unit Compartmentalization Boundary: [32, 33] For all Versions and Paths except National v1.3, Prescriptive Path: ≤ 0.30 CFM50 For National v1.3, Prescriptive Path: ≤ 0.27 CFM50	☐	-	☐	-
4.9.1 For dwelling units with forced air distribution systems without ducted returns and air handlers located in a closet or space adjacent to unconditioned space, the Rater-measured pressure difference between the space containing the air handler and the conditioned space during the compartmentalization test is no greater than 5 Pa. [34]	☐	-	☐	☐

HVAC System [35]		Must Correct	Rater Verified [4]	N/A [5]
5. Heating & Cooling Eqpt. Complete Track A - HVAC Grading by Rater[36] or Track B - HVAC Testing by FT Agent[37]				
Track A	5a.1 Blower fan volumetric airflow is Grade I or II per ANSI / RESNET / ACCA 310.	☐	☐	☐
	5a.2 Blower fan watt draw is Grade I or II per ANSI / RESNET / ACCA 310.	☐	☐	☐
	5a.3 Refrigerant charge is Grade I per ANSI / RESNET / ACCA 310. See Footnote 38 for exemptions.	☐	☐	☐
	5a.4 HVAC manufacturer & model number on installed equipment matches the HVAC Design Report in compliance with ANSI / RESNET / ACCA 310 or the HVAC Design Supplement to Std. 310 for Common Spaces and Central Systems. [39]	☐	☐	☐
Track B	5b.1 HVAC manufacturer & model number on installed equipment matches either of the following (check box):[40] ☐ National HVAC Design Report (4.6-4.9 & 4.25-4.26) ☐ Written approval received from designer	☐	☐	-
	5b.2 External static pressure measured by Rater at contractor-provided test locations and documented below: [41] Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure: _____ IWC	☐	☐	☐
5.5 Prescriptive Path: Heating and cooling equipment serving dwelling units, common spaces, and garages meet the efficiency levels specified in the ENERGY STAR Multifamily Reference Design. Electric resistance space heating is not installed in dwelling units. [42]		☐	☐	☐
5.6 ERI Path: Heating and cooling equipment serving common spaces and garages, but not serving dwelling units, meet the efficiency levels specified in the ENERGY STAR Multifamily Reference Design. See Footnote 42 for restrictions on electric resistance space heating. [42]		☐	☐	☐
5.7 National HVAC Functional Testing Checklist(s) collected prior to certification, with all HVAC systems in the building fully documented. Exception: Where credentialed HVAC Contractor(s) are completing the National HVAC Functional Testing Checklist, the checklist is not required to be collected for the systems they verify. [43]		☐	☐	☐
5.8 Rater has verified and documented that Functional Testing Agent(s) (FT Agent(s)) completing the National HVAC Functional Testing Checklist(s) hold one of the required credentials and completed orientation, if applicable. [43] Credential(s): _____ FT Agent Name(s): _____		☐	☐	☐

Equipment Controls	Must Correct	LP Verified[44]	Rater Verified [4]	N/A [5]
5.9 All heating and cooling systems serving a dwelling unit have thermostatic controls within the dwelling unit.	☐	-	☐	☐
5.9.1 Prescriptive Path: Dwelling unit thermostats are programmable.	☐	-	☐	☐
5.10 For all indoor / terminal units in dwelling units and common spaces: [45]				
5.10.1 Measured zone temperature is within 5°F of zone temperature displayed on thermostat or sensor.	☐	-	☐	☐
5.10.2 System turns on when there is a call for heat and heating is provided. System turns off when the heating setpoint has been met. If N/A, select the reason: ☐ due to high ambient temperature OR ☐ equipment lock-out	☐	-	☐	☐
5.10.3 System turns on when there is a call for cool and cooling is provided. System turns off when the cooling setpoint has been met. If N/A, select the reason: ☐ due to high ambient temperature OR ☐ equipment lock-out	☐	-	☐	☐

Equipment Controls (Cont.)	Must Correct	LP Verified[44]	Rater Verified [4]	N/A [5]
5.11 Where present in CZ 4-8, stair and elevator shaft vents are equipped with motorized dampers that are capable of being automatically closed during normal building operation and are interlocked to open as required by fire and smoke detection systems. Dampers are verified to be closed at the time of inspection.	☐	☐	☐	☐
5.12 Garage heating, plenum heating, and freeze protection systems include automatic controls that are verified to shut systems off above 40°F space or pipe wall temperatures, as applicable. Freeze protection systems include heat tracing of piping, even if self-regulating.	☐	☐	☐	☐
5.12.1 Where heat tracing is installed for freeze-protection, controls must be based on pipe wall temperature and a minimum of R-3 pipe insulation is also required.	☐	☐	☐	☐
5.13 Snow- and ice-melting systems include automatic controls that are verified to shut off the systems when the pavement temperature is above 50°F and no precipitation is falling, and an automatic or manual control is installed that is verified to shut off system when the outdoor temperature is above 40°F, so that the potential for snow or ice accumulation is negligible.	☐	☐	☐	☐
Hydronic Distribution Requirements – Applies to heating or cooling systems serving more than one dwelling unit				
5.14 For hydronic distribution systems, all terminal heating and cooling distribution equipment are separated from the riser or distribution loop by a control valve or terminal distribution pump, so that heated or cooled fluid is not delivered to the dwelling unit distribution equipment when there is no call from the thermostat.	☐	☐	☐	☐
5.15 Terminal units in hydronic distribution systems are equipped with pressure independent balancing valves or pressure independent control valves.	☐	☐	☐	☐
5.16 Piping of a heating or cooling system is insulated in accordance with Item 4.42 on the National HVAC Design Report, including where passing through planks or any other penetrations. [46]	☐	☐	☐	☐
5.17 For circulating pumps serving hydronic heating or cooling systems with three-phase motors, 1 horse-power or larger, motors meet or exceed efficiency standards for NEMA Premium™ motors. If 5 horse-power or larger, also installed with variable frequency drives.	☐	☐	☐	☐
6. Duct Quality Installation – Applies to Heating, Cooling, Ventilation, Exhaust, & Pressure Balancing Ducts, Unless Noted in Footnote.		**Must Correct**	**Rater Verified[4]**	**N/A [5]**
6.1 Ductwork installed without kinks, sharp bends, compressions, or excessive coiled flexible ductwork. [47]		☐	☐	☐
6.2 All bedrooms provided with transfer grilles, jump ducts, dedicated return ducts, and/or undercut doors. Bedrooms with a design supply airflow ≥ 150 CFM (per Item 5.2 on the National HVAC Design Report) achieve a Rater-measured pressure differential ≥ -5 Pa and ≤ +5 Pa with respect to the main body of the dwelling unit when all air handlers are operating. See Footnote 48 for test configuration.		☐	☐	☐
6.3 All supply and return ducts in unconditioned space, including connections to trunk ducts, are insulated to ≥ R-6. [49]		☐	☐	☐
6.3.1 Prescriptive Path: Dwelling unit ductwork and air handlers are installed within conditioned space.		☐	☐	☐
6.4 Rater-measured total duct leakage in dwelling units (and common spaces using ANSI / RESNET / ACCA 310) meets one of the following: [50, 51]				
6.4.1 Rough-in: Tested per allowances below, with air handler & all ducts, building cavities used as ducts, & duct boots installed. In addition, all duct boots sealed to finished surface, Rater-verified at final. [52] No ducted returns [34]: The greater of ≤ 3 CFM25 per 100 sq. ft. of CFA or ≤ 30 CFM. Additionally, the Rater-measured pressure difference between the space containing the air handler and the conditioned space, with the air handler running at high speed, is ≤ 5 Pa. For systems > 1 ton, increase by 1 Pa per half ton. One or two ducted returns [34]: The greater of ≤ 4 CFM25 per 100 sq. ft. of CFA or ≤ 40 CFM. Three or more ducted returns [34]: The greater of ≤ 6 CFM25 per 100 sq. ft. of CFA or ≤ 60 CFM.		☐	☐	☐
6.4.2 Final: Tested per allowances below, with the air handler & all ducts, building cavities used as ducts, duct boots, & register grilles atop the finished surface (e.g., drywall, floor) installed. [53] No ducted returns [34]: The greater of ≤ 6 CFM25 per 100 sq. ft. of CFA or ≤ 60 CFM. Additionally, the Rater-measured pressure difference between the space containing the air handler and the conditioned space, with the air handler running at high speed, is ≤ 5 Pa. For systems > 1 ton, increase by 1 Pa per half ton. One or two ducted returns [34]: The greater of ≤ 8 CFM25 per 100 sq. ft. of CFA or ≤ 80 CFM. Three or more ducted returns [34]: The greater of ≤ 12 CFM25 per 100 sq. ft. of CFA or ≤ 120 CFM.		☐	☐	☐
6.5 Common Space: Supply, return, and exhaust ductwork and all plenums serving common spaces are sealed at all transverse joints, longitudinal seams, and duct wall penetrations with mastic, mastic tape, or internal aerosol-based sealant.		☐	☐	☐
6.6 Duct leakage of central exhaust ductwork serving four or more dwelling units, meets one of the following two options: [54]				
6.6.1 Rough-in: Tested including all ductwork from the exhaust fan location up to, but not including the grilles, the leakage does not exceed 25% of exhaust fan flow. [55, 56, 57]		☐	☐	☐
6.6.2 Final: Tested inclusive of all ductwork between the fan and the grilles, the leakage does not exceed 30% of exhaust fan flow. [55, 56, 57]		☐	☐	☐

7. Dwelling-Unit & Common Space Mechanical Vent. Systems ("Vent Systems") [58] & Inlets in Return Duct [59] (National HVAC Design Report Item # indicated in parenthesis)			
7.1 Ventilation manufacturer & model number on installed equipment matches either of the following (check box): [40] ☐ National HVAC Design Report ☐ Written approval received from designer	☐	☐	-
7.2 Rater-measured ventilation rate is within either ± 15 CFM or ±15% of dwelling unit design values (2.7), and meets or exceeds rates required by ASHRAE 62.2-2010. [60]	☐	☐	-
7.3 Measured ventilation rate is within either ± 15 CFM or ±15% of common space design values (2.9), and meets or exceeds rates required by ASHRAE 62.1-2010 (2.8). [61, 62]	☐	☐	☐
7.4 A ventilation override control installed and also labeled if its function is not obvious (e.g., a label is required for a toggle wall switch, but not for a switch that's on the ventilation equipment).	☐	☐	-
7.5 For any outdoor air inlet connected to a ducted return of the dwelling unit HVAC system (Complete if present; otherwise check "N/A"): [59]			☐
7.5.1 Controls automatically restrict airflow using a motorized damper during vent. off-cycle and occupant override. [63]	☐	☐	-
7.5.2 Rater-measured vent. Rate is ≤ 15 CFM or 15% above design value at highest HVAC fan speed. Alt. in Fn. 64. [64]	☐	☐	-
7.6 Where OA inlets are connected to the dwelling unit HVAC system, a motorized damper is installed that closes when there is no call for ventilation or when fan is off.	☐	☐	☐
7.7 If located in the dwelling unit, system fan rated ≤ 3 sones if intermittent, ≤ 2 sones if continuous, or exempted. [65]	☐	☐	-
7.8 If dwelling-unit Vent System controller operates the dwelling unit HVAC fan, then HVAC fan operation is intermittent and either the fan type is ECM / ICM (4.12), or the controls will reduce the run-time by accounting for HVAC system heating or cooling hours. [66]	☐	☐	☐
7.9 In-unit bathroom fans or in-line fans are ENERGY STAR certified if used as part of the dwelling-unit mechanical ventilation system. [67]	☐	☐	☐
7.10 If central exhaust fans, ≤ 1 HP, are installed as part of the dwelling-unit mechanical ventilation system, then they are direct-drive, ECM, with variable speed controllers. If > 1 HP, their motors meet or exceed efficiency standards for NEMA Premium ™ motors. [68]	☐	☐	☐
7.11 Air inlet locations (Complete if ventilation air inlet locations were installed (2.23, 2.24); otherwise check "N/A"): [69]	-	-	☐
7.11.1 Inlet(s) pull ventilation air directly from outdoors and not from attic, crawlspace, garage, or adjacent dwelling unit.	☐	☐	-
7.11.2 Inlet(s) are ≥ 2 ft. above grade or roof deck; ≥ 10 ft. of stretched-string distance from known contamination sources not exiting the roof, and ≥ 3 ft. distance from dryer exhausts and sources exiting the roof. [70, 71]	☐	☐	-
7.11.3 Inlet(s) are provided with rodent / insect screen with ≤ 0.5 in. mesh.	☐	☐	-

8. Local Mechanical Exhaust (National HVAC Design Report Item # indicated in parenthesis)

Dwelling Unit Mechanical Exhaust – In each dwelling unit kitchen and bathroom, a system is installed that exhausts directly to the outdoors and meets one of the following Rater-measured airflow and manufacturer-rated sound level standards: [58, 72]

Location		Continuous Rate	Intermittent Rate [73]	Must Correct	Rater Verified [4]	N/A [5]
8.1 Kitchen	Airflow	≥ 5 ACH, based on kitchen volume [74, 75] (Alternative in Fn. 74)	≥ 100 CFM and, if not integrated with range, also ≥ 5 ACH based on kitchen volume [74, 75, 76]	☐	☐	-
	Sound	Recommended: ≤ 1 sone	Recommended: ≤ 3 sones			
8.2 Bathroom	Airflow	≥ 20 CFM	≥ 50 CFM	☐	☐	-
	Sound	Required: ≤ 2 sones	Recommended: ≤ 3 sones			

Mechanical Exhaust for Common Spaces [2] and Shared Garages			
8.3 Measured exhaust rates are ≥ ASHRAE 62.1-2010 rates (2c). [61]	☐	☐	☐
8.4 Where an exhaust system is installed in a shared garage, it is equipped with controls that sense CO and NO2.	☐	☐	☐
9. Filtration			
9.1 MERV 6+ filter(s) installed in each ducted mechanical system serving an individual dwelling unit, designed so all return and mechanically supplied outdoor air passes through filter(s) prior to conditioning, and located to facilitate access & regular service by the occupant, building owner, or building maintenance staff. [77]	☐	☐	☐
9.1.1 Filter access panel includes gasket and fits snugly against the exposed edge of filter when closed to prevent bypass. [78]	☐	☐	☐
10. Combustion Appliances			
10.1 Furnaces, boilers, and water heaters located within the building's pressure boundary are mechanically drafted or direct-vented. Alternatives in Footnote 81. [79, 80]	☐	☐	☐
10.2 Fireplaces located within the building's pressure boundary are direct-vented. [79, 80]	☐	☐	☐
10.3 No unvented combustion appliances other than cooking ranges or ovens are located inside the building's pressure boundary. [79]	☐	☐	☐

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Other	Must Correct	LP Verified[44]	Rater Verified [4]	N/A [5]
11. Domestic Hot Water				
11.1 Prescriptive Path: Hot Water Equipment Minimum Efficiency Levels meet or exceed the ENERGY STAR Multifamily Reference Design.	☐	-	☐	☐
11.2 ERI Path: Hot Water Equipment Min. Efficiency Levels for equipment serving common spaces but not dwelling units nor shared laundry meet or exceed the ENERGY STAR Multifamily Reference Design.	☐	-	☐	☐
12. Lighting				
12.1 Common Space [2] Lighting Controls:				
12.1.1 ERI and Prescriptive Path: All common spaces [2] (including shared garages), except the building lobby, mechanical equipment rooms, and where automatic shutoff would endanger the safety of occupants [82], have occupancy or vacancy sensors, programmed timers, or automatic bi-level lighting controls [83] installed and operation has been verified.	☐	☐	☐	☐
12.1.2 ASHRAE Path only: All common spaces [2] (including shared garages), except the building lobby, mechanical equipment rooms, corridors, and stairwells and where automatic shutoff would endanger the safety of occupants [82], have occupancy or vacancy sensors, programmed timers, or automatic bi-level lighting controls [83] installed and operation has been verified.	☐	☐	☐	☐
12.2 Exterior lighting controls: Fixtures, including parking lot fixtures, must include automatic switching on timers or photocell controls except fixtures intended for 24-hour operation, required for security, or associated with the electric meter for an individual dwelling unit.	☐	☐	☐	☐
12.3 Common Spaces [2] , Exterior, and Garages: 90% of installed lighting fixtures are integrated LED fixtures or contain LED lamps. [84]	☐	-	☐	☐
12.4 Prescriptive Path: All dwelling unit lighting fixtures meet the efficiency requirements in the ENERGY STAR Multifamily Reference Design.	☐	-	☐	☐
12.5 Prescriptive Path: Dwelling unit overall in-unit lighting power density ≤ 0.75 W/sq. ft. When calculating overall lighting power density, use 1.1 W/sq. ft. where lighting is not installed. [85]	☐	-	☐	☐

13. Appliances and Plumbing Fixtures	Must Correct	Rater Verified [4]	N/A [5]
13.1 Prescriptive Path: Installed appliances are ENERGY STAR certified. Installed bathroom faucets, bathroom aerators, and showerheads are WaterSense labeled. [86]	☐	☐	☐
13.2 ERI Path: Where installed in common spaces, refrigerators and dishwashers are ENERGY STAR certified and showerheads are WaterSense labeled.	☐	☐	☐
13.3 Prescriptive Path: Shower compartments with multiple fixtures cannot be operated simultaneously OR the total flow rate per shower compartment must not exceed 1.75 gallons per minute, as rated at 80 psi.	☐	☐	☐
14. Whole Building Energy Consumption Data Acquisition Strategy			
14.1 For buildings 50,000 sq. ft. and larger, a strategy that enables the collection of monthly or annual building-level energy consumption data (electricity, natural gas, chilled water, steam, fuel oil, propane, etc.) has been confirmed. [87]	☐	☐	☐

Rater Name: _____ Rater Pre-Drywall Inspection Date(s) [88]:_____ Rater Initials: _____

Rater Company Name: _____ On-site Photos Documented [89] ☐ 📷

Rater Name: _____ Rater Final Inspection Date(s) [90]: _____ Rater Initials: _____

Rater Company Name: _____ On-site Photos Documented [89] ☐ 📷

Builder/Developer Employee: _____ Builder Inspection Date(s): _____ Builder Initials: _____

Builder/Developer Name: _____

Licensed Professional: _____ LP Inspection Date(s): _____ LP Initials: _____

Footnotes:

1. This Checklist applies to all dwelling units, sleeping units, common spaces [2], and garages (open or enclosed, shared or individual) in the building being certified, and where specified, parking lots. These requirements apply to all Paths, unless otherwise specified. These requirements do not apply to parking garages or lots where the cost of the energy use of the parking garage or lot is not the responsibility of the Builder/Developer, Building Owner or Property Manager. This Checklist does not apply to commercial or retail spaces, except in the ASHRAE Path, if included in the energy model and the savings contribute to achieving the Performance Target. This Checklist does not apply to common spaces [2] that are located in buildings on the property without any dwelling or sleeping units. A 'sleeping unit' as defined by ANSI / RESNET / ICC 301, is a room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Where the term 'dwelling unit' is used in this Checklist, the requirement is also required of 'sleeping' units. The term 'building' refers to a structure that encompasses dwelling/sleeping units and (if present) common spaces, sharing one or more of the following attributes: a common street address, a common entrance or exit, central/shared mechanical systems, or structurally interdependent wall or roof systems. Attached structures such as 4-story two-unit structures (commonly referred to as "2-over-2s") may be considered separate buildings if they are divided by a vertical fire separation wall from the foundation to the roof sheathing and share none of the other attributes listed above. A skyway or a breezeway that connects two structures is not considered a common entrance or exit.
2. The term 'common space' refers to any spaces in the building being certified that serve a function in support of the residential part of the building that is not part of a dwelling or sleeping unit. This includes spaces used by residents, such as corridors, stairs, lobbies, laundry rooms, exercise rooms, residential recreation rooms, and dining halls, as well as offices and other spaces used by building management, administration or maintenance in support of the residents. For the ASHRAE Path, the requirements for 'common spaces' apply to commercial or retail spaces where they are included in the energy model and savings contribute to achieving the Performance Target.
3. At the discretion of the Rater, the builder or developer may verify up to five of the indicated Checklist Items. For the purpose of this Checklist, "Builder" represents either the builder or the developer. When this allowance is used for Items marked "Pre-rock + 20", for each dwelling unit, up to 200 sq. ft. of wall areas that have drywall installed prior to general installation of drywall (i.e., "pre-rock" areas such as walls behind tubs or staircases), plus an additional 20 sq. ft., may be builder verified. In the remainder of the building, up to 500 sq. ft. of wall areas that have drywall installed prior to general installation of drywall, plus an additional 50 sq. ft., may be builder verified. For Items marked "20 sq. ft.", up to 20 sq. ft. of area per dwelling unit and 50 sq. ft. in the remainder of the building may be verified by the builder. For Items marked "2 penetrations", up to two penetrations per dwelling unit and 5 in the remainder of the building may be builder verified. The remaining items and areas (i.e., all the applicable area other than what the builder verifies) must be visually verified on-site by the Rater or, for applicable minimum rated features, verified using an alternative on-site inspection protocol defined by ANSI / RESNET / ICC 301 (e.g., for slab insulation or continuous exterior wall insulation). When exercised, the builder's responsibility will be formally acknowledged by the builder, or their designated agent, signing off on the checklist for the item(s) that they verified. However, if a quality assurance review indicates that Items have not been successfully completed, the Rater will be responsible for facilitating corrective action.
4. The term 'Rater' refers to the person(s) completing the third-party verification required for certification. The person(s) shall: a) be a Certified Rater, Approved Inspector, as defined by ANSI / RESNET / IECC 301, or an equivalent designation as determined by a Home Certification Organization (HCO) or Multifamily Review Organization (MRO); and, b) have attended and successfully completed an EPA-recognized training class. See www.energystar.gov/mftraining.

   As stated in the National Program Requirements, Raters who operate under an MRO or an HCO Sampling Protocol are permitted to verify any Checklist Item designated "Rater Verified" using an MRO or HCO-approved sampling protocol. No parties other than Raters are permitted to use sampling to complete this Checklist.
5. The column titled "N/A," which denotes items that are "not applicable," should be used when the checklist Item is not present in the building or conflicts with local requirements.
6. Two alternatives are provided: a) Grade II cavity insulation is permitted to be used for assemblies that contain a layer of continuous, air impermeable insulation ≥ R-3 in Climate Zones 1 to 4, ≥ R-5 in Climate Zones 5 to 8; [1] b) Grade II batts are permitted to be used in floors if they fill the full width and depth of the floor cavity, even when compression occurs due to excess insulation, as long as the R-value of the batts has been appropriately assessed based on manufacturer guidance and the only defect preventing the insulation from achieving Grade I is the compression caused by the excess insulation.
7. Ensure compliance with this requirement using ANSI / RESNET / ICC 301 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the schedule defined by the HCO or MRO that the building is certified under, with approved exceptions listed at www.energystar.gov/ERIExceptions.
8. Window-to-Wall ratio is taken as the sum of all window area divided by the total exterior above-grade wall area. All decorative glass and skylight window area contribute to the total window area to above-grade wall ratio (WWR). Spandrel sections of curtain wall systems contribute to the above-grade wall area.
9. For all Versions except National v1.2 and 1.3, the 2009 IECC Climate Zone designations are applicable, as defined and illustrated in Section R301 of the code. For National v1.2 and 1.3, the 2021 IECC Climate Zone designations are applicable, as defined and illustrated in Section R301 of the code. Note that some locations have shifted to a different Climate Zone in the 2021 IECC compared to prior editions.
10. Item 1.5 is not applicable to wood-framed walls. Item 1.5 is also not applicable to the concrete floor edge associated with a podium since Item 3.5 applies. Item 1.5 is applicable to walls separating conditioned space from the exterior, including walls that are adjacent to other buildings and the wall area associated with between floor spandrels and intermediate floor perimeter edges..
11. Mass walls utilized as the thermal mass component of a passive solar design (e.g., a Trombe wall) are exempt from Item 1.5. To be eligible for this exemption, the passive solar design shall be comprised of the following five components: an aperture or collector, an absorber, thermal mass, a distribution system, and a control system. For more information, see: www.energy.gov/sites/prod/files/guide_to_passive_solar_home_design.pdf.

    Mass walls that are not part of a passive solar design (e.g., CMU block or log home enclosure) shall either utilize the strategies outlined in Item 1.5 or the pathway in the assembly with the least thermal resistance, as determined using a method consistent with the 2013 ASHRAE Handbook of Fundamentals, shall provide ≥ 50% of the applicable assembly resistance, defined as the reciprocal of the mass wall equivalent U-factor in the 2009 IECC Table 502.1.2. Documentation identifying the pathway with the least thermal resistance and its resistance value shall be collected by the Rater and any Builder Verified or Rater Verified box under Item 1.5 shall be checked.

12. Up to 10% of the total exterior wall surface area is exempted from the reduced thermal bridging requirements to accommodate intentionally designed details. This exemption does not apply to steel columns or the repeated concrete floor perimeter edges of a multistory building. To calculate the exempted wall area, the Rater shall sum the areas of the following features that either prevent the use of, or interrupt, continuous insulation when they are present in the design: architectural details (e.g., wing walls, shading devices, roof overhangs, projected balconies, brick returns, stone window sills, metal panels, or masonry fireplaces); cladding details (e.g., non-thermally broken shelf angles, metal clips, metal brackets, and metal z-girts; but not stand-off shelf angles, screws, bolts, or brick ties); mechanical openings (e.g., PTACs, PTHPs, through-wall air conditioners). It shall be apparent to the Rater that the exempted areas are intentionally designed details, or the exempted area shall be documented in a plan provided by the builder, architect, or engineer. The Rater need not evaluate the necessity of the designed detail to certify the building.
13. If used, insulated siding shall be attached directly over a water-resistive barrier and sheathing. In addition, it shall provide the required R-value as demonstrated through either testing in accordance with ASTM C 1363 or by attaining the required R-value at its minimum thickness. Insulated sheathing rated for water protection can be used as a water resistant barrier if all seams are taped and sealed. If non-insulated structural sheathing is used at corners, the advanced framing details assessed by Item 3.4 shall be met for those wall sections.
14. In a building undergoing a substantial reconstruction or rehabilitation, continuous interior insulation may be used in lieu of continuous exterior rigid insulation or insulated siding. This alternative does not require continuous interior insulation where a floor intersects an exterior wall, it only requires it from floor to ceiling. Continuous interior insulation is required where the demising wall intersects the exterior wall; however, it may be exempted per Footnote 12.
15. As an alternative to the insulation in Table 502.1.2, a maximum U-factor of 0.123 is permitted where compliance with Item 2.1 of the Rater Design Review Checklist is documented using the Multifamily Workbook and the concrete slab floor is explicitly entered as a row in the table.
16. While the EPA recommends insulating interior columns for a minimum of R-5 for 4 vertical ft. and vertically along other areas of discontinuity, such as where walls intersect the concrete slab; this is not required.
17. Compliance with Items 1.7 and 1.8 is not required for buildings pursuing the ASHRAE Path, but the energy used by the heating systems must be modeled following the requirements in the Simulation Guidelines, available at www.energystar.gov/mfguidance. Heated plenums and garages with space heating must also comply with Item 5.12.
18. Where conditioned space is above the plenum, in lieu of insulating the top of the plenum, the bottom of the plenum may be used to comply with Items 1.7.2 and 1.7.3, if its insulation meets the requirements of Item 1.7.2 and, where applicable, Item 1.6. When using this alternative, the bottom of the plenum must meet all the requirements for floor insulation which include a fully-aligned air barrier as described in Footnote 20 and Grade I installation per Item 1.2.
19. The bottom of the heated plenum is permitted to be suspended ceiling tiles or other non-air barrier material. If fiberglass insulation is installed, it shall achieve a Grade I or Grade II install.
20. For purposes of this Checklist, an air barrier is defined as any durable solid material that blocks air flow between conditioned space and unconditioned space, including necessary sealing to block excessive air flow at edges and seams and adequate support to resist positive and negative pressures without displacement or damage. The EPA recommends, but does not require, rigid air barriers.

    Open-cell or closed-cell foam shall have a finished thickness ≥ 5.5 in. or 1.5 in., respectively, to qualify as an air barrier unless the manufacturer indicates otherwise.

    If flexible air barriers such as house wrap are used, they shall be fully sealed at all seams and edges and supported using fasteners with caps or heads ≥ 1 in. diameter unless otherwise indicated by the manufacturer. Flexible air barriers shall not be made of kraft paper, paper-based products, or other materials that are easily torn. If polyethylene is used, its thickness shall be ≥ 6 mil.
21. All insulated ceiling surfaces, regardless of slope (e.g., cathedral ceilings, tray ceilings, conditioned attic roof decks, flat ceilings, sloped ceilings), must meet the requirements for ceilings, unless the ceiling is adiabatic.
22. All insulated vertical surfaces are considered walls (e.g., above and below grade exterior walls, knee walls) and must meet the air barrier requirements for walls. The following exceptions apply: air barriers recommended, but not required, in adiabatic walls; and, in Climate Zones 4 through 8, an air barrier at the interior vertical surface of insulation is recommended but not required in basement walls or crawlspace walls. For the purpose of these exceptions, a basement or crawlspace is a space for which ≥ 40% of the total gross wall area is below-grade.
23. The EPA highly recommends, but does not require, an air barrier at the interior vertical surface of floor insulation in Climate Zones 4-8. [9]
24. Examples of supports necessary for permanent contact include staves for batt insulation or netting for blown-in insulation. Alternatively, supports are not required if batts fill the full depth of the floor cavity, even when compression occurs due to excess insulation, as long as the R-value of the batts has been appropriately assessed based on manufacturer guidance and the only defect preventing the insulation from achieving the required installation grade is the compression caused by the excess insulation.
25. Alternatively, an air barrier is permitted to be installed at the exterior horizontal surface of the floor insulation if the insulation is installed in contact with this air barrier, the exterior vertical surfaces of the floor cavity are also insulated, and air barriers are included at the exterior vertical surfaces of this insulation.
26. Reduced thermal bridging details, while not mandatory, will improve the comfort and efficiency of the building and help meet the ENERGY STAR performance target, as well as the thermal backstop in Item 1.1, EPA recommends, but does not require, that builders include details on plans to ensure proper implementation during construction.
27. Item 3.5 applies to all balconies and projected slabs and first floor podiums, but does not otherwise apply to the intermediate concrete floor perimeter edges above the podium of a multistory building as those are subject to Item 1.5.
28. Concrete floor edges meeting one of the following are considered to have a thermal break:
    a. For projected concrete floors that are not resting on podiums, one of the following insulation options is met:
        i. Install ≥ R-2 insulation at the floor edge between conditioned space and the projected slab; OR
        ii. Install ≥ R-5 insulation, above and below the concrete slab that extends horizontally for a minimum of 4 ft. Insulation installed on top of slab shall be covered by a durable floor surface. When entering the floor edge into the Multifamily Workbook, R-1 insulation may be associated with the area of the wall that is uninsulated due to the projected slab.

b. For all concrete floors resting on podiums, including projected concrete floors, one of the following is met:
   i. R-5 insulation is installed that extends from the top of the floor edge and continues a minimum of 4ft. on both interior and exterior surfaces of the wall below the floor edge. For podiums that are at-grade or continue below-grade, insulate to a minimum of 4ft. or a depth of 2 ft.; OR
   ii. For projected slabs only: Insulation is installed per a.i. or a.ii. above AND R-5 insulation is installed that extends from the bottom of the floor edge and continues a minimum of 4ft. on both interior and exterior surfaces of the wall below the floor edge. For podiums that are at-grade or continue below-grade, insulate to a minimum of 4ft. or a depth of 2 ft.; OR
   iii. Where the horizontal slab is not in direct contact with the exterior wall, R-5 insulation is installed at the slab edge continuous with the floor insulation under the slab.; OR
   iv. Floor insulation meeting the requirements of Item 1.6 is installed above the slab and provides a continuous thermal break where it intersects the wall.

29. In CZ 4-8, where a building has concrete podiums, balconies, or projected slabs, with or without thermal breaks, the building must document compliance with Item 2.1 of the Rater Design Review Checklist using the Multifamily Workbook.

    Where a thermal break has not been met based on the requirements in Footnote 28:

    1. For the ASHRAE or ERI Paths, in the energy model, the concrete floor edge area must be modeled with R-0.
    2. In addition, for all Paths, in the Multifamily Workbook, a row representing this floor edge area should be added as either “Projected Concrete Floor Edge / Balcony” or “Podium Floor Edge” as applicable, with the following U-factors:
       a. Where the concrete floor is above conditioned space, U-1.20.
       b. Where the concrete floor is above unconditioned space, U-1.64.

    Where a thermal break has been met based on the requirements in Footnote 28:

    1. For the ASHRAE or ERI Paths, in the energy model, the concrete floor edge area must be modeled with the insulation provided at that edge, which may be different than the R-value of the wall above.
    2. In addition, for all Paths, in the Multifamily Workbook, a row representing this floor edge area should be added as either “Projected Concrete Floor Edge / Balcony” or “Podium Floor Edge” as applicable, with the U-factor associated with the assembly based on the insulation installed.

30. Slab edge insulation shall be assessed for slab-on-grade floors with a floor surface less than 24 in. below grade, including where an insulated wall separates a garage, patio, or other unconditioned space from the conditioned space of the building. Whether insulated or not, these perimeters must be documented in the energy model and, where using to document compliance with Item 2.1 of the Rater Design Review Checklist, the Multifamily Workbook. F-Factors for use in the Multifamily Workbook shall be determined using the guidance available at www.energystar.gov/F-Factor.

31. For dwelling or sleeping units adjacent to garages, the EPA recommends, but does not require, carbon monoxide (CO) alarms installed in a central location in the immediate vicinity of each separate sleeping zone and according to NFPA 720.

32. Where a sampling protocol is permitted in accordance with the National or California Program Requirements, at least 20% of the dwelling or sleeping units adjacent to a garage shall be selected for testing.

33. Air leakage shall be measured and documented by a Rater using ANSI / RESNET / ICC 380 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the schedule defined by the HCO or MRO that the building is being certified under.

34. A ‘ducted return’ is defined as a continuous duct made of sheet metal, duct board, or flexible duct that connects one or more return grilles to the return-side inlet of the air handler. Any other approach to convey air from return or transfer grille(s) to the air handler, such as the use of building cavities, does not constitute a ‘ducted return’. Where there are no ‘ducted returns’, the duct leakage test shall include the leakage from the air handler and supply side of the forced air system. Where building cavities used to return air to the air handler are included in the duct leakage test, the allowances for “One or two ducted returns” shall be permitted.

35. This section of the Checklist is designed to meet ASHRAE 62.1-2010 or later, ASHRAE 62.2-2010 or later, and ANSI / ACCA’s 5 QI-2015 protocol, thereby improving the performance of HVAC equipment in new multifamily buildings when compared to multifamily buildings built to minimum code. However, these features alone cannot prevent all ventilation, indoor air quality, and HVAC problems, (e.g., those caused by a lack of maintenance or by occupant behavior). Therefore, this Checklist is not a guarantee of proper ventilation, indoor air quality, or HVAC performance.

36. To be eligible for Track A – HVAC Grading by Rater, dwelling units must have at least one unitary HVAC system including air conditioners or heat pumps up to 65 kBtuh, or furnaces up to 125 kBtuh (i.e., within the scope of ANSI / RESNET / ACCA Standard 310). Track A – HVAC Grading by Rater shall use ANSI / RESNET / ACCA 310 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the schedule defined by the HCO or MRO that the building is being certified under for all dwelling units.

37. For Track A, all unitary HVAC Systems including air conditioners and heat pumps up to 65 kBtuh and furnaces up to 125 kBtuh serving individual dwelling units shall comply with 5a.1 through 5a.4 for the building to be certified. Other systems within the scope of ANSI / RESNET / ACCA 310, except for serving common spaces, may meet Items 5a.1 through 5a.4, or meet Item 5a.4 and Sections 2 and 3 on the National HVAC Functional Testing Checklist. When systems serving common spaces complete Items 5a.1 through 5a.3 they are exempt from meeting the prerequisite ANSI / RESNET / ACCA 310 design review criteria.

    For Track B, Item 5b.1 is applicable for all systems. Item 5b.2 is applicable to split air conditioners, unitary air conditioners, air-source heat pumps, and water-source (i.e., geothermal) heat pumps up to 65 kBtuh with forced-air distribution systems (i.e., ducts) and to furnaces up to 225 kBtuh with forced-air distribution systems (i.e., ducts). All systems shall comply with 5b.1 and 5b.2, as applicable, for the building to be certified.

    If, based on the selected Track, an Item in Section 5 is not applicable to any systems in the building, the Rater shall mark ‘N/A’ for that Item.

38. If the non-invasive procedure in ANSI / RESNET / ACCA 310 is not permitted to be used during the final inspection of a unit (i.e., due to the equipment type or to outdoor air temperatures that do not meet the requirements of the non-invasive method), then the unit is permitted to be

certified with a default refrigerant charge designation of Grade III. Note that in these circumstances, the weigh-in method procedure in ANSI / RESNET / ACCA 310 may still be used to pursue a Grade I designation.

39. While this verification is completed as part of ANSI / RESNET / ACCA 310, it must also be documented in this checklist.
40. If installed equipment does not match the National HVAC Design Report, then prior to certification the Rater shall obtain written approval from the designer (e.g., email, updated National HVAC Design Report) confirming that the installed equipment meets the requirements of the National HVAC Design Report. In addition, the Rater shall verify that all installed equipment are still exempted types per Footnote 30 of the National HVAC Design Report or, if no longer an exempted type, shall re-review Section 3b of the National Rater Design Review Checklist to ensure compliance with all requirements (e.g., full completion of HVAC Design Report, HVAC design tolerances). In cases where the condenser unit is installed after the time of inspection by the Rater, the HVAC manufacturer and model numbers on installed equipment can be documented through the use of photographs provided by the HVAC Contractor or Functional Testing Agent after installation is complete.
41. The Rater shall measure and record the external static pressure in the return-side and supply-side of the system using the contractor-provided test locations. However, at this time, the Rater need not assess whether these values are within a specific range to certify the dwelling unit. Ductless systems and systems with a total amount of supply ductwork or distribution building cavities ≤ 10 ft. in length are exempted from this requirement. The Rater is also not required to measure external static pressure for multi-split systems and may mark “N/A”. If the space provided in Item 5b.2 does not accommodate all the measurements, use the table in Appendix A to supplement.
42. Electric resistance heating specified in common spaces has a total heating capacity ≤ 12 kBtu/h (3.5 kW) per enclosed space and has automatic thermostatic controls. Electric resistance limitations do not apply to heat pumps with integral supplemental or emergency electric resistance heating. The EPA recommends but does not require that heat pumps have controls to limit the use of emergency or supplemental heat to heat pump failures or when the heat pump cannot meet the heating load. The EPA also recommends but does not require that heat pumps in CZ 5-8 are ENERGY STAR certified cold-climate heat pumps. Electric resistance limitations do not apply to systems dedicated to heating outdoor air supplied by a mechanical ventilation system, as long as the space served is primarily heated by a non-electric-resistance system that meets the efficiency requirements noted in the ENERGY STAR Multifamily Reference Design. Electric resistance limitations apply to garages, but do not apply to heated plenums meeting Item 5.12, or stairwells where automatic thermostatic controls prevent operation above 50°F.
43. Functional Testing Agents must hold an approved credential, as listed at www.energystar.gov/ftas, or must be a representative of the Original Equipment Manufacturer (OEM), or a contractor credentialed by an HVAC Quality Installation Training and Oversight Organization (H-QUITO), if not completing Sections 5 and higher. Functional Testing Agents may not be the installing contractor, nor employed by the same company as the installing contractor, unless they are a credentialed contractor. An explanation of the credentialing process and links to H-QUITOs, which maintain lists of credentialed contractors, can be found at www.energystar.gov/findhvac. A directory of other FT Agents can be found at www.energystar.gov/ftas. Raters can confirm FT Agents have met the requirements by documenting they are listed in a directory. For Track A, Sections 2 and 3 of the National HVAC Functional Testing Checklist do not need to be completed for systems using ANSI / ACCA / RESNET 310 and meeting Items 5a.1 – 5a.4.
44. At the discretion of the Rater, a Licensed Professional (LP), (i.e., a Registered Architect or Professional Engineer in good standing and with a current license), may verify any of the items in Sections 5, and 12 of this Checklist, where a checkbox is provided for “LP Verified”. When exercised, the LP’s responsibility will be formally acknowledged by the LP signing off on the checklist for the item(s) that they verified. However, if a quality assurance review indicates that Items have not been successfully completed, the Rater will be responsible for facilitating corrective action.
45. Item 5.10 must be completed for all heating and cooling equipment located within dwelling units and common spaces, including, but not limited to the indoor units associated with split systems (e.g., split air conditioners and air-source heat pumps, mini-splits, multi-splits), unitary air conditioners, furnaces, unit heaters, PTAC’s, PTHP’s, GLHP’s, WLHP’s, fan coils, and hydronic distribution systems. For shared VRF systems, where a Rater is using sampling to complete Item 5.10, Raters must select units from a representative sample of the associated outdoor units.
46. Item 5.16 does not apply to factory-installed piping within HVAC equipment or piping that conveys fluids having a design operating temperature range between 60°F and 105°F, inclusive.
47. Kinks are to be avoided and are caused when ducts are bent across sharp corners such as framing members. Sharp bends are to be avoided and occur when the radius of the turn in the duct is less than one duct diameter. Compression is to be avoided and occurs when flexible ducts in unconditioned space are installed in cavities smaller than the outer duct diameter and ducts in conditioned space are installed in cavities smaller than inner duct diameter. Ducts shall not include coils or loops except to the extent needed for acoustical control.
48. Item 6.2 does not apply to ventilation ducts, exhaust ducts, or non-ducted systems. For an HVAC system with a multi-speed fan, the highest design fan speed shall be used when verifying this requirement. When verifying this requirement, doors separating bedrooms from the main body of the dwelling unit (e.g., a door between a bedroom and a hallway) shall be closed and doors to rooms that can only be entered from the bedroom (e.g., a closet, a bathroom) shall be open. The Rater-measured pressure shall be rounded to the nearest whole number to assess compliance.
49. Item 6.3 does not apply to ducts that are a part of local mechanical exhaust or exhaust-only dwelling-unit mechanical ventilation systems. The EPA recommends, but does not require, that all metal ductwork not encompassed by Section 6 (e.g., exhaust ducts, duct boots, ducts in conditioned space) also be insulated and that insulation be sealed to duct boots to prevent condensation.
50. Item 6.4 generally applies to the ducts of space heating, space cooling, and dwelling-unit mechanical ventilation systems.

    However, visual inspection is permitted in lieu of testing for the following system types: 1) a dwelling-unit mechanical ventilation system not connected to the space heating or space cooling system, regardless of the number of dwelling units it serves, except where testing is required by Item 6.6; 2) a space heating or space cooling system for which the ducts and air handler are in conditioned space and the total supply duct length of the system, including all supply trunks and branches, is ≤ 10 ft.; and 3) a space heating or space cooling system that serves more than one dwelling unit. In such cases, a Rater shall visually verify that all seams and connections are sealed with mastic or metal tape and all duct boots are sealed to floor, wall, or ceiling using caulk, foam, or mastic tape.

    For duct systems requiring testing, duct leakage shall be determined and documented by a Rater using ANSI / RESNET / ICC 380 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the schedule defined by the HCO or MRO that the building is being certified under. Leakage limits shall be assessed on a per-system, rather than per-dwelling unit, basis.

51. Note that compliance with Item 6.4.1 or 6.4.2 in conjunction with Section 3a of the National Rater Design Review Checklist automatically achieves Grade I total duct leakage per ANSI / RESNET / ACCA 310.
52. Cabinets (e.g., kitchen, bath, multimedia) or ducts that connect duct boots to toe-kick registers are not required to be in place during the 'rough-in' test.
53. Registers atop carpets are permitted to be removed and the face of the duct boot temporarily sealed during testing. In such cases, the Rater shall visually verify that the boot has been durably sealed to the subfloor (e.g., using duct mastic or caulk) to prevent leakage during normal operation.
54. Item 6.6 does not apply to central exhaust systems serving clothes dryers but is required for the central exhaust portion of balanced systems such as HRVs and ERVs.
55. Duct leakage shall be measured using one of the following two options:
    a. Measure duct leakage using a duct leakage tester: To determine leakage, measure duct leakage by testing at the design or average operating pressure following the procedures available at www.energystar.gov/centralexhausttest. Where testing at the design or average operating pressure is not feasible, testing at 50 Pa is permitted, however the following flow equation must be used to determine the leakage allowance at 50 Pa:

    $$CFM_{50} = CFM_{design} / [P_{design}^{(0.65)} / 50^{(0.65)}]$$

    The design pressure, P_{design}, can be obtained from the HVAC Designer and typically is reported on the mechanical schedule as the "external static pressure" or "ESP". Where reported in "inches of water column", convert to Pascals: 1 in. w.c. = 250 Pascals. Compare the measured leakage to the applicable leakage allowances.

    Where testing at rough-in, to calculate the 25% leakage allowance, the 'exhaust fan flow' shall be the lesser of the rated fan flow (i.e., nameplate rating) and 133% of the sum of the design exhaust airflow of the spaces served by that fan.

    Where testing at final, to calculate the 30% leakage allowance, the 'exhaust fan flow' shall be the lesser of the rated fan flow (i.e., nameplate rating) and 143% of the sum of the design exhaust airflow of the spaces served by that fan.

    Measured fan flow (either at the fan itself or the total airflow measured from all exhaust grilles served by the fan) may be used in lieu of the rated fan flow to determine the leakage allowance.

    To calculate central exhaust duct leakage allowance, the EPA recommends using worksheet 3b of the Multifamily Workbook.

    b. Measure duct leakage as the difference in exhaust system airflows: To determine leakage, first the total exhaust airflow from a central exhaust fan is measured by a Rater or certified air-balancing contractor. Duct leakage is then calculated as the difference of the total measured exhaust fan airflow and the sum of the measured exhaust airflows from each of the spaces served by the fan. This test option is only permitted for exhaust fans with a rated fan flow (i.e., nameplate rating) that does not exceed 143% of the sum of the design exhaust airflow of the spaces served by that fan. Where there are more than 8 exhaust fans, sampling at a rate of 1 in 7 is permitted after 7 exhaust fans demonstrate compliance with Item 6.6.2.
56. Where testing for duct leakage following the pressurization or depressurization test procedure in Footnote 55a, sampling is permitted given the following requirements are all met:
    a. No less than 50% of the exhaust ductwork, based on total linear feet, are tested. Where failures occur, the percentage of total linear feet required to be tested increases by 10%.
    b. Where aerosol-based sealant is used on some but not all ductwork, the ductwork selected for testing must be representative of all sealing strategies used in the building.
    c. Testing only a portion of the ductwork associated with an exhaust fan is permitted, however the total tested ductwork in the building must include representative portions of all ductwork sections, such as vertical risers, main trunks, horizontal run outs, branches, take-offs, and register boxes.
    d. Floor plans or riser diagrams that clearly document the total duct length and the length of the duct sections tested must be collected and retained by the Rater.
    e. Where portions of ductwork are tested, the leakage allowed is calculated by multiplying the total allowance by this ratio: linear feet being tested divided by the total duct length served by the fan.
57. Where aerosol-based sealant is used on an entire exhaust ductwork system (i.e., 100% of the ductwork between an exhaust fan and the grilles served by the fan), the duct-sealing contractor is permitted to perform the duct leakage test. The Rater is not required to witness these tests. Where the duct-sealing contractor is not performing the test on all exhaust ductwork systems, at least 50% of the ductwork in the untested systems, based on linear feet, shall be tested by the Rater according to the requirements in Footnote 56.
58. As defined by ANSI / RESNET / ICC 301-2019, a Dwelling Unit Mechanical Ventilation System is a ventilation system consisting of powered ventilation equipment such as motor-driven fans and blowers and related mechanical components such as ducts, inlets, dampers, filters and associated control devices that provides dwelling-unit ventilation at a known or measured airflow rate.
59. Item 7.5 applies to any outdoor air inlet connected to a ducted return of the dwelling unit HVAC system, regardless of its intended purpose (e.g., for ventilation air, make-up air, combustion air). This Item does not apply to HVAC systems without a ducted return.
60. The dwelling-unit ventilation air flows and local exhaust air flows shall be determined and documented by a Rater using ANSI / RESNET / ICC 380 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the schedule defined by the HCO or MRO that the building is being certified under. To facilitate testing the air flow of a microwave-integrated exhaust fan, Raters are permitted to tape off all air inlets except at the bottom. However, no correction factors shall be applied to the measured air flow to account for the increased airflow restriction. In Item 7.2, the dwelling-unit ventilation rates required by ASHRAE 62.2-2010 can be calculated using the Multifamily Workbook or the following equation: 0.01 x Conditioned Floor Area + 7.5 x (number of bedrooms + 1). For sleeping units, the following equation must be used: 0.01 x Conditioned Floor Area + 7.5 x (number of beds). Where local codes do not permit dwelling-unit ventilation to exceed ASHRAE 62.2-2010 rates, Rater-measured ventilation rate is permitted to be 0-15 CFM less than rates required by ASHRAE 62.2-2010. Designers are permitted to provide multiple combinations of a design ventilation airflow rate, run-time per cycle, and cycle time. When multiple

combinations are provided, the Rater shall first assess the run-time setting of the installed system and use that to determine the corresponding design ventilation rate. The Rater-measured ventilation rate must fall within the program-specified tolerance relative to that design ventilation rate.

61. While common spaces are not under the scope of ANSI / RESNET / ICC 380, the ventilation air flow and exhaust air flows in common spaces shall be measured in accordance with the procedures in ANSI / RESNET / ICC 380. The air flows may be measured by a Rater or a certified air-balancing contractor under the observation of a Rater. Sampling is only permitted where airflows are measured directly by the Rater. Where a system provides supply air that is a mix of return and outdoor air, and not 100% outdoor air, the outdoor air airflow shall be measured and compared to the total supply airflow to determine percentage of outdoor air supplied. This percentage shall be applied to airflow measured at supply registers to determine outdoor air provided for comparison to design airflow rates. Where the building has total corridor space ≤ 250 sq. ft. and does not contain any of the other common spaces which require outdoor air per Item 2.2 of the National HVAC Design Report, outdoor air is not required to be provided to the corridor.
62. For permits on or before 01/01/2024, where outdoor air is supplied via a PTAC or PTHP, in lieu of measurement, the design CFM shall meet or exceed the ventilation rates required by ASHRAE 62.1-2010 and the space served by the PTAC or PTHP shall have at least one operable window. For permits after 01/01/2024, both the runtime and measurement of outdoor air through these systems will be required to demonstrate compliance with ASHRAE 62.1-2010 or alternative ventilation system specified (e.g., ducted supply).
63. For example, if an outdoor air inlet connected to a ducted return is used as a dedicated source of outdoor air for an exhaust ventilation system (e.g., bath fan), the outdoor airflow must be automatically restricted when the exhaust fan is not running and in the event of an override of the exhaust ventilation system.

    In dwelling / sleeping units in multifamily buildings, automatic restriction of airflow is exempted if a manual shutoff damper is used with a continuous exhaust ventilation system and is readily-accessible, labeled as the override, and not used as a balancing damper.
64. When assessing the ventilation rate, the highest HVAC fan speed applicable to ventilation mode shall be used (e.g., if the inlet only opens when the HVAC is in 'fan-only' mode, then test in this mode). If the inlet has a motorized damper that only opens when the local mechanical kitchen exhaust is turned on, then testing is not required.

    When required, the ventilation airflow through the inlet shall be measured and documented by a Rater using ANSI / RESNET / ICC 380 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the schedule defined by the HCO or MRO that the building is being certified under. As an alternative, measurement of the outdoor airflow can be waived if a Constant Airflow Regulating (CAR) damper with a manufacturer-specified maximum flow rate no higher than 15 CFM or 15% above the ventilation design value is installed on the inlet.
65. Dwelling-unit mechanical ventilation fans shall be rated for sound at no less than the airflow rate in Item 2.7 of the National HVAC Design Report. Fans exempted from this requirement include HVAC air handler fans, remote-mounted fans, and intermittent fans rated ≥ 400 CFM. To be considered for this exemption, a remote-mounted fan must be mounted outside the habitable spaces, bathrooms, toilets, and hallways and there shall be ≥ 4 ft. ductwork between the fan and intake grille. Per ASHRAE 62.2-2010, habitable spaces are intended for continual human occupancy; such space generally includes areas used for living, sleeping, dining, and cooking but does not generally include bathrooms, toilets, hallways, storage areas, closets, or utility rooms.
66. Note that the 'fan-on' setting of a thermostat would not be an acceptable controller because it would continuously operate the HVAC fan.
67. Bathroom fans with a rated flow rate ≥ 500 CFM and heat/energy recovery ventilation fans are exempted from the requirement to be ENERGY STAR certified.
68. As an alternative to meeting or exceeding the efficiency standards for NEMA Premium motors, documentation that an exhaust fan motor has a fan energy index (FEI) ≥ 1.2 at the design point of operation OR a fan efficacy ≥ 1.1 CFM/Watt is permitted.
69. Without proper maintenance, ventilation air inlet screens often become filled with debris. Therefore, the EPA recommends, but does not require, that these ventilation air inlets be located so as to facilitate access and regular service by the building owner or maintenance staff. Ventilation air inlets that are only visible via rooftop access are exempted from Item 7.11 and the Rater shall mark "N/A".
70. Two alternatives to the required 10 ft. distance are provided: 1) inlets providing outdoor air to a dwelling unit are permitted to be ≥ 5 ft. of stretched-string distance from outlets of both exhaust dwelling-unit mechanical ventilation systems and local mechanical exhaust systems, and 2) the outlet and inlet of ERV's and HRV's may use a smaller distance if allowed by the manufacturer of the system. If the second alternative is used, the manufacturer's instructions shall be collected for documentation purposes.
71. Known contamination sources include, but are not limited to, stacks, vents, exhausts, and vehicles.
72. Continuous bathroom local mechanical exhaust fans shall be rated for sound at no less than the airflow rate in Item 8.2. Intermittent bathroom and both intermittent and continuous kitchen local mechanical exhaust fans are recommended, but not required, to be rated for sound at no less than the airflow rate in Items 8.1 and 8.2. Per ASHRAE 62.2-2010, an exhaust system is one or more fans that remove air from the building, causing outdoor air to enter by ventilation inlets or normal leakage paths through the building envelope (e.g., bath exhaust fans, range hoods, clothes dryers). Per ASHRAE 62.2-2010, a bathroom is any room containing a bathtub, shower, spa, or similar source of moisture.
73. An intermittent mechanical exhaust system, where provided, shall be designed to operate as needed by the occupant. Control devices shall not impede occupant control in intermittent systems.
74. Where 5 ACH is selected, kitchen volume shall be determined by drawing the smallest possible rectangle on the floor plan that encompasses all cabinets, pantries, islands, peninsulas, ranges / ovens, and the kitchen exhaust fan, and multiplying by the average ceiling height for this area. In addition, the continuous kitchen exhaust rate shall be ≥ 25 CFM, per 2009 IRC Table M1507.3, regardless of the rate calculated using the kitchen volume. Cabinet volume shall be included in the kitchen volume. As an alternative to 5 ACH for dwelling units and sleeping units, 50 CFM of continuous exhaust is permitted to be used, regardless of kitchen volume. In such cases, the edge of the exhaust fan or intake grille shall be located within 10 ft. of the edge of the range, as measured horizontally on the floor plan.
75. Alternatively, the prescriptive duct sizing requirements in Table 5.3 of ASHRAE 62.2-2010 or later are permitted to be used for kitchen exhaust fans based upon the rated airflow of the fan at 0.25 IWC. If the rated airflow is unknown, ≥ 6 in. smooth duct shall be used, with a rectangular to round duct transition as needed. Guidance to assist partners with these alternatives is available at www.energystar.gov/newhomesguidance. As an alternative to Item 8.1, dwelling units are permitted to use a continuous kitchen exhaust rate of 25 CFM per 2009 IRC Table M1507.3, if they

are either a) Phius or PHI certified, or b) provide both dwelling-unit ventilation and local mechanical kitchen exhaust using a balanced system, and have a Rater-verified whole-building infiltration rate ≤ 1.0 ACH50 or ≤ 0.05 CFM50 per sq. ft. of Enclosure Area. 'Enclosure Area' is defined as the area of the surfaces that bound the volume being pressurized / depressurized during the test.

76. All intermittent kitchen exhaust fans must be capable of exhausting at least 100 CFM. In addition, if the fan is not part of a vented range hood or appliance-range hood combination (i.e., if the fan is not integrated with the range), then it must also be capable of exhausting ≥ 5 ACH, based on the kitchen volume.
77. Based upon, ASHRAE 62.2-2010, ducted mechanical systems are those that supply air to an occupiable space with a total amount of supply ductwork exceeding 10 ft. in length and through a thermal conditioning component, except for evaporative coolers. Systems that do not meet this definition are exempt from this requirement. Filters are recommended, but not required, for mini-split systems, HRV's, and ERV's. HVAC filters located in the attic shall be considered accessible to the occupant, building owner, or building maintenance staff if either 1) drop-down stairs, a pull-down ladder, or door provide access to attic and a permanently installed walkway has been provided between the attic access location and the filter or 2) the filter location enables arm-length access from a portable ladder without the need to step into the attic and the height of the ceiling access panel or the bottom of the wall access panel where access is provided is ≤ 12 ft.
78. Sealing mechanisms comparable to a gasket are also permitted to be used. The filter media box (i.e., the component in the HVAC system that houses the filter) may be either site-fabricated by the installer or pre-fabricated by the manufacturer to meet this requirement. These requirements only apply when the filter is installed in a filter media box located in the HVAC system, not when the filter is installed flush with the return grille.
79. The pressure boundary is the primary enclosure boundary separating indoor and outdoor air. For example, a volume that has more leakage to outside than to conditioned space would be outside the pressure boundary.
80. Per the 2009 International Mechanical Code, a direct-vent appliance is one that is constructed and installed so that all air for combustion is derived from the outdoor atmosphere and all flue gases are discharged to the outside atmosphere; a mechanical draft system is a venting system designed to remove flue or vent gases by mechanical means consisting of an induced draft portion under non-positive static pressure or a forced draft portion under positive static pressure; and a natural draft system is a venting system designed to remove flue or vent gases under nonpositive static vent pressure entirely by natural draft.
81. Naturally drafted equipment is only allowed if located in a space outside the pressure boundary, where the envelope assemblies separating it from conditioned space are insulated and air-sealed.
82. For common spaces where automatic lighting controls are not installed due to safety concerns associated with automatic lighting shutoff, the architect or engineer must provide the specific location(s) where this concern is applicable. The Rater shall retain a copy of the email or letter that documents the location(s) for their records and check the box in the "Rater Verified" column. For Item 12.1.1, this exemption does not apply to corridors or stairwells; where safety is a concern in those spaces, the ASHRAE Path should be pursued.
83. Bi-level lighting controls include any design strategy that achieves at least one intermediate step between all fixtures being fully ON and fully OFF that provides 30-70% of full lighting power to that space. This can be achieved by light fixtures with integral bi-level controls or with occupancy sensors that activate select fixtures ON/OFF, while the others remain fully on.
84. This requirement applies to exterior lighting fixtures that are attached to the building, but does not apply to landscape or parking lot lighting fixtures. For the ASHRAE Path, where the proposed lighting power in a given space is modeled with 30% or greater savings compared to the allowance in the Simulation Guidelines, field measurement of footcandles is required.
85. For senior housing buildings, Prescriptive Path dwelling unit overall in-unit lighting power density is permitted to be ≤ 1.3 W/sq. ft., using 1.65 W/sq. ft. where lighting is not installed.
86. Appliances include refrigerators, dishwashers, clothes washers, and clothes dryers. Where an appliance type is not eligible for ENERGY STAR certification, (e.g., commercial dryers) the appliance is exempt from this requirement. Where a bathroom faucet or aerator is not eligible for WaterSense certification, (e.g., public use lavatory faucets) the fixture is exempt from this requirement.
87. Building area shall be calculated according to Gross Floor Area as defined by ENERGY STAR Portfolio Manager, which specifies to measure from the outside surface of exterior walls and includes all areas inside the building and excludes parking areas. Refer to the ENERGY STAR Portfolio Manager Glossary for a complete definition. Strategies include: an agreement with the utility companies to provide the aggregated building-level data, in a spreadsheet format or directly through Portfolio Manager; OR evidence that securing signed utility data release forms will be a mandatory component of all lease agreements; OR installation of a building-level energy monitor, data acquisition system, or utility-owned energy meter. If an energy monitor is installed, the builder shall provide the building operator with the manufacturer's documentation and operations manual. The EPA recommends, but does not require, that one of these strategies also be implemented in buildings 25,000-49,999sq. ft.
88. Any Item that will be concealed by drywall (e.g., wall insulation) must be verified during the pre-drywall inspection.
    If drywall is installed prior to the inspection, then it must be entirely removed to fully verify all Items. It is not sufficient to remove only portions of drywall to inspect a subset of areas. Furthermore, it is not acceptable to complete a Sampled Rating on a unit that has missed the pre-drywall inspection. Additional information is available in the Technical Bulletin: Pre-Drywall Inspection Is Always Required.
89. The Rater is required to capture photos according to the Photo Documentation Guidance Document available at www.energystar.gov/mfnc, which generally requires one representative photo per building for each specified item, as well as one geo-tagged and time-stamped photo of the Rater in front of the dwelling unit or building during each inspection.
90. Some Items can typically only be verified at a later stage of construction than when the pre-drywall inspection occurs (e.g., bath fan airflow). Any Item that has not been verified during the pre-drywall inspection must be verified prior to or during the final inspection.

Appendix A – Supplementary tables for Section 5

5. Heating & Cooling Equipment			
5b.2 External static pressure measured by Rater at contractor-provided test locations and documented below:	**Must Correct**	**Rater Verified [4]**	**N/A [5]**
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐
Dwelling Unit / Common Space Served: _____ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure _____ IWC	☐	☐	☐

SECTION 01 9114 - COMMISSIONING AUTHORITY RESPONSIBILITIES

PART 1 GENERAL

1.01 SUMMARY

A. Commissioning is intended to achieve the following specific objectives; this section covers the Commissioning Authority's responsibilities for commissioning:
   1. Verify that the work is installed in accordance with Contract Documents and the manufacturer's recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Prefunctional Checklists are utilized to achieve this.
   2. Verify and document that functional performance is in accordance with Contract Documents: Functional Tests performed by Contractor and witnessed by the Commissioning Authority are utilized to achieve this.
   3. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed O&M data submittals are specified.
   4. Verify that the Owner's operating personnel are adequately trained: Formal training conducted by Contractor is specified.

B. Commissioning, including Functional Tests, O&M documentation review, and training, is to occur after startup and initial checkout and be completed before Substantial Completion.

C. Coordinate and direct all the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties, frequently updated timelines and schedules and technical expertise.

1.02 SCOPE OF COMMISSIONING

A. The following are to be commissioned:

B. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.

1.03 REFERENCE STANDARDS

A. ASHRAE Guideline 1.1 - The HVAC Commissioning Process; 2012.

1.04 SUBMITTALS

A. Commissioning Plan:
   1. Submit preliminary draft for review by Owner and Architect within 30 days after commencement of Commissioning Authority contract.
   2. Submit revised draft to be included in the construction Contract Documents, not less than 4 weeks prior to bid date.
   3. Submit final plan not more than 90 days after commencement of construction, for issuance to all parties.

B. List of Prefunctional Checklists to be developed:
   1. Submit preliminary list at start of construction documents phase or within 30 days after commencement of contract, whichever is later.
   2. Submit revised list not less than 6 weeks prior to bid date, for inclusion in the construction Contract Documents.
   3. Submit final list not more than 60 days after start of construction.

C. Prefunctional Checklists:
   1. Submit preliminary draft at start of construction documents phase or within 30 days after commencement of contract, whichever is later.
   2. Submit revised draft for review by Owner and Architect not less than 6 weeks prior to bid date, for inclusion in the construction Contract Documents.
   3. Submit final draft to Contractor not less than 4 weeks prior to startup of particular items to be commissioned.

D. List of Functional Test procedures to be developed:
   1. Submit preliminary list at start of construction documents phase or within 30 days after commencement of contract, whichever is later.
   2. Submit revised list not less than 6 weeks prior to bid date, for inclusion in Contract Documents; this is intended to be a list of titles, not full description of the tests.
   3. Submit final list not more than 60 days after start of construction.

E. Functional Test Procedures:
   1. Submit preliminary draft at start of construction documents phase or within 30 days after commencement of contract, whichever is later.
   2. Submit revised draft for review by Owner and Architect not less than 6 weeks prior to bid date, for inclusion in the construction Contract Documents.
   3. Submit final draft to Contractor not less than 4 weeks prior to startup of particular items to be commissioned.

F. Training Plan.

G. Recommissioning Manual: Submit within 60 days after receipt of Owner's instructions to proceed with preparation.

H. Commissioning Process Record: Submit to Contractor for inclusion with O&M manuals. Include, at a minimum the following:

I. Final Commissioning Report: Submit to Owner. Include the following:

PART 3 EXECUTION

2.01 COMMISSIONING PLAN

A. Prepare and implement the Commissioning Plan, covering commissioning schedule, Prefunctional Checklist and Functional Test procedures, coordination requirements, and forms to be used, for all parties in the commissioning process.
   1. Call and chair meetings of the Commissioning team when appropriate.
   2. Give Contractor sufficient notice for scheduling commissioning activities.
   3. Develop a comprehensive start-up and initial systems checkout plan with cooperation of Contractor and subcontractors.

4. ASHRAE Guideline 1.1 may be used as a guide for the Commissioning Plan.
5. Avoid replication of information included in the construction Contract Documents to the greatest extent possible.

B. Review the construction Contract Documents for Contractor submittals of draft checklists, draft test procedures, manufacturer startup procedures, and other information intended for the use of the Commissioning Authority in preparing the Commissioning Plan.

C. Commissioning Schedule:
1. Coordinate with Contractor anticipated dates of startup of each item of equipment and system.
2. Contractor's scheduling responsibilities are specified in the construction Contract Documents.
3. Revise and re-issue schedule monthly.
4. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
5. Deliver relevant Prefunctional Checklists and Functional Test Procedures to Contractor in time to avoid delay.

2.02 CONSTRUCTION CONTRACT DOCUMENTS

A. General Commissioning Specifications: Architect has prepared general commissioning specifications for inclusion in the construction Contract Documents; review and submit comments to Owner.
1. These specifications include:
a. Procedures applicable to all types of items to be commissioned.
2. Prepare specifications for any of the following that would be recommended, for incorporation into the construction Contract Documents by Architect:
a. Additional Contractor submittals needed for purposes of commissioning, such as startup procedures, draft test procedures, draft training plans, etc.
b. Additional Owner personnel training.
c. Additional operation or maintenance data that should be submitted.

B. Prefunctional Checklists: Develop detailed Checklists for each item to be commissioned.
1. List of Checklists to be Developed: Prepare and maintain a detailed list of titles, not full text.
2. The Checklist forms are intended to be part of the Contractor's Contract Documents.

C. Functional Testing: Develop detailed procedures for each item to be commissioned; submit for review by Owner and Architect.
1. List of Test Procedures to be Developed: Prepare and maintain a detailed list of titles, not full text.
2. The forms the Commissioning Authority will use to report Functional Test results are not intended to be part of Contractor's Contract Documents, but the Functional Test Procedures that must be executed by the Contractor must be made part of the Contract Documents, by modification if necessary.

D. Develop any other reporting forms Contractor will be required to use; if they are likely to require a substantially different amount of work than the Contractor can reasonably anticipate, they must be included in the construction Contract Documents.

E. If any part of the documents described above have not been developed by the bid date, coordinate with Architect the issuance of modifications to the construction Contract Documents

2.03 PREFUNCTIONAL CHECKLISTS

A. Prefunctional Checklists - Content: Prepare forms for Contractor's use, in sufficient detail to document that the work has been installed in accordance with Contract Documents and the manufacturer’s recommendations and instructions, and that it receives adequate operational checkout prior to startup.
1. Prepare separate Checklists for each type of equipment, system, or other assembly, customized to the item.
2. Identify each Checklist by using Contract Documents identification number or name, if any; if none, create unique identifiers for each Checklist; do not rely on Contractor to number checklists.
3. Multiple identical or near-identical items may appear on a single Checklist provided there is space to record all required data for each separately; label each set of data uniquely.
4. Include space to record manufacturer name, model number, serial number, capacity and other relevant characteristics, and accessories and other features as applicable; include space to record "as specified", "as submitted", and "as installed" data.
5. Include space to record whether or not the required submittals have been received; list each separate type of submittal.
6. Include line items for each physical inspection to be performed.
7. Include line items for each operational inspection to be performed, such as checking switch operation, fan rotation, valve and damper stroke, and measuring actual electrical loads.
8. Include separate section for sensors and actuators, with space for documenting actual physical location and calibration measurements; provide a separate generic calibration checklist identified wherever referenced.
9. Include spaces to record that related Checklists for related work upon which this work depends have been completed.

B. Prefunctional Checklists - Format:
1. Provide a cover sheet showing name of equipment item or system, documentation identification number (see Documentation Identification Scheme), names of accessory components involved, and identification of related checklists.
2. Include on cover sheet space for Contractor's use in attesting to completeness; provide spaces for the signatures of the general contractor and each subcontractor or other entity responsible, customized to the project and the type of item.
3. Include on the cover sheet, above the signature block, the following statement: "The work referenced in this Checklist and other work integral to or dependent on this work is complete and ready for functional testing.

The checklist items are complete and have been checked off only by parties having direct knowledge of the event." Include two checkboxes:

a. "This Checklist is submitted for approval with no exceptions."
b. "This Checklist is submitted for approval, subject to the attached list of outstanding items, none of which preclude the performance of safe and reliable functional tests. A statement of completion will be submitted upon completion of the outstanding items."

4. Use a consistent, tabular format for all Checklists, with one line per checklist activity.
5. For each line item, provide space for initials and date, and identification of the subcontractor or other entity responsible.

2.04 FUNCTIONAL TEST PROCEDURES

A. Develop test procedures in sufficient detail to demonstrate that functional performance is in accordance with Contract Documents, including proper operation through specified modes of operation where there is a different system response, including seasonal, unoccupied, warm-up, cool-down, part- and full-load regimes.
   1. Obtain assistance and review by installing subcontractors.
   2. Itemize each test sequence in step-by-step order, with acceptance criteria for each step and for the test as a whole.
   3. Include test setup instructions, description of tools and apparatus, special cautions, and.
   4. Avoid procedures that would void or otherwise limit warranties; review with Contractor prior to execution.
   5. For HVAC systems, procedures may include energy management control system trending, stand-alone datalogger monitoring, or manual functional testing.
   6. Obtain explicit approval of Contractor in regard to feasibility and safety prior to execution.
B. Functional Test Forms: Prepare and distribute forms in advance of testing. Use a consistent format to the greatest degree practicable. For each form, include the following:
   1. Signature Block: Signature of the designated commissioning lead and the system and equipment installer attesting that the recorded test results are accurate.

2.05 CONSTRUCTION PHASE

A. Coordinate the commissioning work with Contractor and Construction Manager; ensure that commissioning activities are being incorporated into the master schedule.
B. Perform site visits, as necessary, to observe component and system installations. Attend planning and job-site meetings to obtain information on construction progress. Review Contractor's meeting minutes for issues relating to the commissioning process. Assist in resolving discrepancies.
C. Commissioning Kick-Off Meeting: Plan and conduct a meeting early in the construction phase to review proposed commissioning schedule, activities, and responsibilities with parties involved. Require attendance by every member of the Commissioning Team.
D. Conduct periodic meetings as necessary to coordinate, resolve planning issues, and aid in resolution of deficiencies, minimizing the time spent by Contractor and Owner personnel; hold meetings at least monthly.
E. Submit periodic progress reports to Owner and Contractor.
F. Review Contractor shop drawing submittals applicable to systems being commissioned for compliance with commissioning needs; verify that Owner's responsibilities are clearly defined in warranties.
G. Review and approve submittals directly related to commissioning.
H. Deliver Prefunctional Checklists and Functional Test procedures to Contractor.
I. Verify satisfactory completion of Prefunctional Checklists by Contractor by reviewing checklists and by site observation and spot checking; provide formal approval when satisfactory.
J. Verify startup of all systems by reviewing start-up reports and by site observation; provide formal approval when satisfactory.
K. Coordinate, witness and approve Functional Tests performed by Contractor. Coordinate retesting until satisfactory performance is achieved.
L. HVAC Commissioning:
   1. Gather and review the control sequences and interlocks and work with Contractor and design engineers until sufficient clarity has been obtained, in writing, to be able to prepare detailed Functional Test procedures.
   2. Witness all or part of HVAC piping test and flushing procedures, sufficient to be confident that proper procedures were followed; document testing and include documentation in O&M manuals.
   3. Witness all or part of duct testing and cleaning procedures, sufficient to be confident that proper procedures were followed; document testing and include documentation in O&M manuals.
   4. Review TAB Plan prepared by Contractor.
   5. Before TAB is executed, witness sufficient Functional Testing of the control system to approve it to be used for TAB.
   6. Verify air and water systems balancing by spot testing, by reviewing completed reports, and by site observation; provide formal approval when satisfactory.
   7. Analyze trend logs and monitoring data to verify performance.
M. Witness and document testing of systems and components over which the Commissioning Authority does not have direct control, such as smoke control systems, tests contracted directly by Owner, and tests by manufacturer's personnel; include documentation in O&M manuals.
N. When Functional Testing for specific systems or equipment is specified to be performed by the Commissioning Authority rather than the Contractor, perform such testing without assistance of Contractor.
O. Maintain a master deficiency and resolution log and a separate testing record. Provide written progress and test reports with recommended actions.

P. Operation and Maintenance Data: Review submitted operation and maintenance data for completeness; provide formal approval if satisfactory.
Q. Notify Contractor and Owner of deficiencies in procedures or results; suggest solutions.

2.06 TRAINING

A. Training Plan: Prepare a comprehensive Training Plan, incorporating draft training plans submitted by Contractor.
   1. Include a ____ hour session by the HVAC design engineer covering the overall HVAC system and equipment design concepts, with one-line schematic drawings.
   2. Include a ____ hour session by the Commissioning Authority on the use of the blank Prefunctional Checklists and Functional Test forms for re-commissioning purposes.
   3. Establish criteria for determining satisfactory completion of training.
B. Verify that training was satisfactorily completed; provide formal approval if satisfactory.

2.07 CLOSEOUT

A. Commissioning Record: Use the same format and organization as specified for the O&M manuals.
   1. Include the Final Commissioning Plan and Final Report.
   2. For each product or system and equipment item, include the following organized as indicated, with separator tabs:
      a. Design intent documentation, furnished by Architect or others.
      b. Detailed operational sequences.
      c. Startup plan and approved startup reports.
      d. Filled out Prefunctional Checklists.
      e. Filled out Functional Test reports; trend logs and monitoring reports and analysis; other verification documentation.
      f. Training plan and training records.
      g. Recommissioning recommendations, including time schedule and procedures; include blank copies of all Prefunctional Checklists and Functional Test report forms.
B. Final Commissioning Report: Include:
   1. Executive summary.
   2. List of participants and roles.
   3. Brief facility description.
   4. Overview of commissioning scope and general description of testing and verification methods.
   5. For each item commissioned, an evaluation of adequacy of:
      a. The product itself; i.e. compliance with Contract Documents.
      b. Installation.
      c. Functional performance; include a brief description of the verification method used and observations and conclusions from the testing.
      d. O&M documentation, including design intent.
      e. Operator training.
   6. List of all outstanding non-compliance items, referenced to the specific functional test, inspection, trend log, etc., where the deficiency is documented.
   7. List of unresolved issues, seasonal or deferred testing, and other concerns that could affect facility operation.
   8. Recommendations for improvement to equipment or operations, future actions, commissioning process changes, etc. (about four to six pages).
   9. Attach appendices containing all commissioning documentation, including logs, minutes, reports, deficiency lists, communications, findings, etc., except that specified to be part of the Commissioning Record.
C. Recommissioning Manual: Revise the Commissioning Plan documents, checklists, and Functional Test forms as necessary based on accepted recommendations of the final Commissioning Report. Provide step-by-step instructions for recommissioning, blank forms, and cross-references to O&M data needed during recommissioning.

2.08 POST-OCCUPANCY PHASE

A. Coordinate deferred and seasonal Functional Tests; verify correction of deficiencies.
B. On-Site Review: 10 months after Substantial Completion conduct on-site review with Owner's staff.
   1. Review the current facility operation and condition of outstanding issues related to the original and seasonal commissioning.
   2. Interview staff to identify problems or concerns they have operating the facility as originally intended.
   3. Make suggestions for improvements and for recording these changes in the O&M manuals.
   4. Identify areas of concern that are still under warranty or are the responsibility of the original construction contractor.
   5. Assist facility staff in developing reports, documents and requests for services to remedy outstanding problems.

END OF SECTION

SECTION 02 4100 - DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 1000 - Summary: Sequencing and staging requirements.

C. Section 01 1000 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

D. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

E. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.

F. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.

PART 2 PRODUCTS

2.01 MATERIALS

PART 3 EXECUTION

3.01 SCOPE

A. Remove portions of existing buildings as indicated on the drawings.

B. Remove other items indicated, for salvage, relocation, and recycling.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01 7000.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain required permits.
2. Comply with applicable requirements of NFPA 241.
3. Use of explosives is not permitted.
4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
5. Provide, erect, and maintain temporary barriers and security devices.
6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.

C. Do not begin removal until receipt of notification to proceed from Owner.

D. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

E. Perform demolition in a manner that maximizes salvage and recycling of materials.

1. Comply with requirements of Section 01 7419 - Waste Management.
2. Dismantle existing construction and separate materials.
3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

3.03 EXISTING UTILITIES

A. Protect existing utilities to remain from damage.

B. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

C. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

D. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

E. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Separate areas in which demolition is being conducted from other areas that are still occupied.

B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

C. Protect existing work to remain.

1. Repair adjacent construction and finishes damaged during removal work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 7419 - Waste Management.
C. Leave site in clean condition, ready for subsequent work.
D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 0100 - MAINTENANCE OF CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cleaning of existing concrete surfaces.
B. Resurfacing of concrete surfaces having spalled areas and other damage.
C. Repair of deteriorated concrete.
D. Scope of Work: As indicated on drawings.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Indicate product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with minimum of 3 years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturers' instructions for storage, shelf life limitations, and handling of products.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

A. Detergent: Non-ionic detergent.

2.02 CEMENTITIOUS PATCHING AND REPAIR MATERIALS

A. Manufacturers:
1. ARDEX Engineered Cements: www.ardexamericas.com.
2. Kaufman Products Inc: www.kaufmanproducts.net.
3. Master Builders Solutions: www.master-builders-solutions.com/en-us.
4. The QUIKRETE Companies: www.quikrete.com.
5. SpecChem, LLC: www.specchemllc.com.
6. W. R. Meadows, Inc: www.wrmeadows.com.
7. Substitutions: See Section 01 6000 - Product Requirements.

2.03 ACCESSORIES

A. Portland Cement: ASTM C150/C150M, Type I, grey.
B. Sand: ASTM C33/C33M or ASTM C404; uniformly graded, clean.
C. Water: Clean and potable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work.

3.02 CLEANING EXISTING CONCRETE

A. Provide enclosures, barricades, and other temporary construction as required to protect adjacent work from damage.

3.03 CONCRETE SURFACE REPAIR USING CEMENTITIOUS MATERIALS

A. Clean concrete surfaces, cracks, and joints of dirt, laitance, corrosion, and other contamination using method(s) specified above and allow to dry.
B. Fill voids with cementitious mortar flush with surface.
C. Trowel finish to match adjacent concrete surfaces.

END OF SECTION

PART 2 PRODUCTS

END OF SECTION

SECTION 03 2000 - CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete.

B. Section 04 2000 - Unit Masonry: Reinforcement for masonry.

1.03 REFERENCE STANDARDS

A. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).

B. ACI 318 - Building Code Requirements for Structural Concrete; 2019 (Reapproved 2022).

C. ACI SP-66 - ACI Detailing Manual; 2004.

D. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.

E. ASTM A184/A184M - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement; 2006 (Reapproved 2011).

F. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.

G. ASTM A497/A497M - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete; 2007.

H. CRSI (DA4) - Manual of Standard Practice; 2009.

I. CRSI (P1) - Placing Reinforcing Bars; 2011.

1.04 SUBMITTALS

A. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.

1. Prepare shop drawings under seal of a Professional Structural Engineer experienced in design of work of this type and licensed in the State in which the Project is located.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301.

1. Maintain one copy of each document on project site.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 PLACEMENT

A. Do not displace or damage vapor barrier.

B. Accommodate placement of formed openings.

C. Maintain concrete cover around reinforcing as follows:

1. Walls (exposed to weather or backfill): 3 inch.

2. Footings and Concrete Formed Against Earth: 3 inch.

3.02 FIELD QUALITY CONTROL

END OF SECTION

SECTION 03 3000 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.
B. Floors and slabs on grade.
C. Concrete reinforcement.
D. Joint devices associated with concrete work.
E. Miscellaneous concrete elements, including equipment pads, light pole bases, flagpole bases, thrust blocks, and manholes.
F. Concrete curing.

1.02 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; American Concrete Institute International; 2010.
B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2009).
C. ACI 301 - Specifications for Structural Concrete; American Concrete Institute International; 2010 (Errata 2012).
D. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (Errata 2007).
E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.
F. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 2010.
G. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 2010.
H. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).
I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.
J. ACI 347 - Guide to Formwork for Concrete; American Concrete Institute International; 2004.
K. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.
L. ASTM A497/A497M - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete; 2007.
M. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Billet-Steel Bars for Concrete Reinforcement; 2015.
N. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.
O. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2014.
P. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2014.
Q. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.
R. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2012.
S. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
T. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
U. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
V. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.
W. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2012.
X. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.
Y. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2013.
Z. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014.
AA. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2014.
BB. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
CC. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011.
DD. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
C. Samples: Submit samples of underslab vapor retarder to be used.
D. For Sustainable Design Requirements, see Section 01 8113.
E. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used; use LEED New Product Content Form.

1.04 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.
B. Follow recommendations of ACI 305R when concreting during hot weather.
C. Follow recommendations of ACI 306R when concreting during cold weather.

D. For slabs required to include moisture vapor reduction admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for every day of placement.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347 to provide formwork that will produce concrete complying with tolerances of ACI 117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
3. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.02 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).

1. Type: Deformed billet-steel bars.

B. Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain type.

1. Form: Coiled Rolls.
2. Mesh Size: 6 x 6.

C. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.
2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal Portland type.

1. Acquire all cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C 33.

1. Acquire all aggregates for entire project from same source.

C. Fly Ash: ASTM C618, Class C or F.

D. Calcined Pozzolan: ASTM C618, Class N.

E. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.

F. Fiber Reinforcement: ASTM C1116/C1116M.

1. Fiber Length: 1.5 inch, nominal.
2. Products:
   a. Forta Corporation; FORTA-FERRO: www.forta-ferro.com.
   b. Substitutions: See Section 01 6000 - Product Requirements.

2.04 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

C. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.

D. Water Reducing Admixture: ASTM C494/C494M Type A.

E. Moisture Vapor Reduction Admixture (MVRA): Liquid, inorganic admixture free of volatile organic compounds (VOCs) and formulated to close capillary systems formed during curing to reduce moisture vapor emission and transmission, with no adverse effect on concrete properties.

1. Provide admixture in slabs to receive adhesively applied flooring.
2. Show that concrete properties are not adversely affected by testing in accordance with ASTM C494/C494M and submitting independent agency test reports.
3. Show successful initial and long-term application of adhered flooring by submitting details of ten (10) completed projects along with owner and contractor contact information for verification by Architect.
4. Admixture manufacturer shall provide a warranty guaranteeing to remove and replace failed flooring and apply a moisture vapor barrier coating over failed slabs; term of warranty shall be for the lifetime of the concrete construction from the date at which installation of flooring is approved by admixture manufacturer.
5. Contractor shall submit certification that he has received, understands, and will comply with admixture manufacturer's prerequisites for issuance of manufacturer's warranty; failure to comply with admixture manufacturer's prerequisites will result in assignment of warranty remedy costs to Contractor.

2.05 ACCESSORY MATERIALS

A. Underslab Vapor Retarder ASTM E1745, Class A, with a permeance of less than 0.01 as tested after mandatory conditioning; and stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs.

1. Installation: Comply with ASTM E1643.
2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, double-sided tapes, for sealing the vapor barrier at the perimeter, and for sealing seams and penetrations in vapor retarder.
3. Products:
   a. Vapor Block 15 mil, by Raven Industries: www.ravenind.com
   b. Stego Industries, LLC; Stego Wrap Vapor Barrier 15 -mil (Class A): www.stegoindustries.com.
   c. W.R. Meadows, Inc.; PERMINATOR Class A – 15 mils: www.wrmeadows.com.

d. Substitutions: See Section 01 6000 - Product Requirements.

B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

1. ASTM C1107/C1107M; Grade A, B, or C.
2. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch.
3. Flowable Products:
   a. ProSpec, an Oldcastle brand; C-1107 Construction Grout: www.prospec.com.
   b. The QUIKRETE Companies; QUIKRETE® Exterior Use Anchoring Cement: www.quikrete.com.
   c. SpecChem, LLC; SC Precision Grout: www.specchemllc.com.
   d. W. R. Meadows, Inc.; 588-10K: www.wrmeadows.com.
   e. Substitutions: See Section 01 6000 - Product Requirements.

2.06 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.

B. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.

1. Material: ASTM D1751, cellulose fiber.

C. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with minimum 1 inch diameter holes for conduit or rebars to pass through at 6 inches on center; ribbed steel stakes for setting.

2.07 CURING MATERIALS

A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement. Provide type compatible with scheduled finish floor materials (if any).

B. Curing Compound, Non-dissipating: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C309.

1. Application: Use at all interior slabs scheduled to remain exposed.
2. Vehicle: Water-based.
3. Gloss: High.
4. Products:
   a. L&M Construction Chemicals, Inc., a subsidiary of Laticrete International, Inc.; Dress & Seal WB: www.lmcc.com.
   b. L&M Construction Chemicals, Inc., a subsidiary of Laticrete International, Inc.; Dress & Seal WB 30: www.lmcc.com.
   c. The QUIKRETE Companies; QUIKRETE® Acrylic Concrete Cure & Seal: www.quikrete.com.

C. Moisture-Retaining Sheet: ASTM C171.

D. Polyethylene Film: ASTM D2103, 4 mil thick, clear.

E. Water: Potable, not detrimental to concrete.

2.08 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.

1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

D. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.

E. Normal Weight Concrete:

1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As scheduled.
2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.

2.09 MIXING

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.

B. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

1. Use latex bonding agent only for non-load-bearing applications.

C. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade in accordance with ASTM E1643 and follow manufacturer's written instructions.

1. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as shown on the drawings. Do not use sand.
2. Following leveling and tamping of granular base for slabs on grade, place vapor barrier sheeting with longest dimension parallel with direction of pour and face laps away from the expected direction of the placement whenever possible.
3. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.
4. Overlap joints 6 inches and seal with manufacturer's seam tape.
5. Apply seam tape to a clean and dry vapor barrier.
6. Seal all penetrations (including pipes) per manufacturer's instructions.
7. Avoid the use of non-permanent stakes driven through vapor retarder.
8. If non-permanent stakes are driven through vapor retarder, repair as recommended by vapor retarder manufacturer.
9. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture and tensile.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.
B. Place concrete for floor slabs in accordance with ACI 302.1R.
C. Notify Architect not less than 48 hours prior to commencement of placement operations.
D. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
E. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 SLAB JOINTING

A. Locate joints as indicated on the drawings.
B. Anchor joint fillers and devices to prevent movement during concrete placement.
C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:
   1. Exposed Concrete Floors: 1/4 inch in 10 ft.
   2. Under Seamless Resilient Flooring: 1/4 inch in 10 ft.
   3. Under Carpeting: 1/4 inch in 10 ft.
B. Correct the slab surface if tolerances are less than specified.
C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.
B. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
   1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
C. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
   1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and terrazzo with full bed setting system.
   2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.
   3. Decorative Exposed Surfaces: "Steel trowel" as described in ACI 302.1R; use steel-reinforced plastic trowel blades instead of steel blades to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, pigmented concrete, surfaces to be polished, and all other slab surfaces.
   4. Exterior slabs - broom finish (11.7.4), Class C tolerance (11.9.3) with tooled picture frame edges.

3.08 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
C. Surfaces Not in Contact with Forms:
   1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.

2. Final Curing: Begin after initial curing but before surface is dry.

3.09 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000.
B. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
C. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
D. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.
E. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
F. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.
G. Slab Testing: Cooperate with manufacturer of specified moisture vapor reduction admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.

3.10 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.11 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

3.12 SCHEDULE - CONCRETE TYPES AND FINISHES

A. The following classes of concrete are required (3.2):
   1. Class I - footings, piers: Minimum f'c=3000 psi.
   2. Class II - interior slabs on grade, and all interior concrete not otherwise identified. Minimum f'c=3500 psi; water-reducer required. Minimum cement content 517 lbs. per cubic yard.
   3. Class III - exterior slabs on grade, retaining walls, basement walls and all exterior concrete not otherwise identified. Minimum f'c=4000 psi; air-entraining admixture and water-reducer required. Maximum water-cement ratio: 0.48, air content: 5 + 1.5% (3.4.1).
   4. Class IV - backfill below footings. Minimum f'c=1500 psi (lean mix).
   5. Class V - topping over precast concrete slabs, fill in stair pans and treads. Minimum f'c=3500 psi, with water-reducing admixture and #8 coarse aggregate. Minimum cement content 611 lbs. per cubic yard.
B. Class IV concrete may be site mixed: all other concrete is to be ready-mixed (7.1 And 7.2). All admixtures are to be added at the batch plant, except that superplasticizer, if used, is to be added at the site.
C. Concrete used for floors (Classes II and V) is to have a minimum three-day compressive strength of 1800 psi (3.14.2).
D. Slump:
   1. Design concrete mixes for a maximum slump of 4 inches, unless a superplasticizer is to be used.
   2. If a superplasticizer is to be used, design mixes for a slump of 2 inches - 3 inches before its addition; maximum slump permitted after its addition is 8 inches.

SECTION 04 2000 - UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete block.
B. Mortar and grout.
C. Reinforcement and anchorage.
D. Flashings.
E. Lintels.
F. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 6200 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.
B. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2024.
C. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.
D. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2023.
E. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.
F. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
G. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
H. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
I. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
J. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2018.
K. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.
L. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.
M. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
C. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for brickwork support system.
D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
E. Manufacturer's Qualification Statement.
F. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
B. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.
C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
    1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depth of 8 inches.
    2. Load-Bearing Units: ASTM C90, normal weight.
        a. Exposed Faces: Architect to select from manufacturer's standard range of finishes.

2.02 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91/C91M, Type S and Type O.
B. Portland Cement: ASTM C150/C150M, Type I; color to produce approved color sample.
C. Hydrated Lime: ASTM C207, Type S.
D. Mortar Aggregate: ASTM C144.
E. Grout Aggregate: ASTM C404.
F. Water: Clean and potable.
G. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
    1. Type: Type S.
    2. Color: Architect to select from standard colors..
    3. Manufacturers:
        a. Amerimix, an Oldcastle brand; AMX 405C: www.amerimix.com.
        b. Amerimix, an Oldcastle brand; AMX 410: www.amerimix.com.
        c. **Basis of Design:** Heidelberg Materials; Brixment: www.heidelbergmaterials.us.
        d. Substitutions: See Section 01 6000 - Product Requirements.

H. Packaged Dry Material for Mortar for Repointing: Premixed Portland cement, hydrated lime, and graded sand; capable of producing Type O mortar in accordance with ASTM C270 with the addition of water only.
  1. Color: To match existing.
  2. Manufacturers:
    a. **Basis of Design:** Heidelberg Materials; Brixment: www.heidelbergmaterials.us.
    b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 REINFORCEMENT AND ANCHORAGE

A. Manufacturers:
  1. Blok-Lok Limited: www.blok-lok.com.
  2. **Basis of Design:** Hohmann & Barnard, Inc; X-Seal Anchor: www.h-b.com.
  3. WIRE-BONDwww.wirebond.com.
  4. Substitutions: See Section 01 6000 - Product Requirements.

B. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi), deformed billet bars; galvanized.

C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

D. Single Wythe Joint Reinforcement: ASTM A951/A951M.
  1. Type: Truss or ladder.
  2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
  3. Size: 0.1483 inch side rods with 0.1483 inch cross rods; width to provide not less than 5/8 inch of mortar coverage on each exposure.

E. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
  1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
  2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
  3. Vertical adjustment: Not less than 3-1/2 inches.

2.04 FLASHINGS

A. Metal Flashing Materials:
  1. Prefabricated Metal Flashing: Smooth fabricated 12 oz/sq ft copper flashing for surface mounted conditions.
    a. Manufacturers:
      1) **Basis of Design:** Hohmann & Barnard, Inc: www.h-b.com.
      2) Mortar Net Solutions: www.mortarnet.com.
      3) Substitutions: See Section 01 6000 - Product Requirements.

B. Drip Edge: Stainless steel; angled drip with hemmed edge; compatible with membrane and adhesives.
  1. Manufacturers:
    a. **Basis of Design:** Hohmann & Barnard, Inc: www.h-b.com.
    b. Mortar Net Solutions; Metal Drip Edges: www.mortarnet.com.
    c. Substitutions: See Section 01 6000 - Product Requirements.

C. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

2.05 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
  1. Manufacturers:
    a. Hohmann & Barnard, Inc: www.h-b.com.
    b. Substitutions: See Section 01 6000 - Product Requirements.

B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; in maximum lengths available.
  1. Manufacturers:
    a. Hohmann & Barnard, Inc: www.h-b.com.
    b. Substitutions: See Section 01 6000 - Product Requirements.

C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.06 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
  1. Masonry below grade and in contact with earth: Type S.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:

1. Bond: Running.
2. Coursing: One unit and one mortar joint to equal 8 inches.
3. Mortar Joints: Concave.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
B. Lay hollow masonry units with face shell bedding on head and bed joints.
C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
D. Remove excess mortar and mortar smears as work progresses.
E. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
F. Interlock intersections and external corners, except for units laid in stack bond.
G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
I. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

3.06 REINFORCEMENT AND ANCHORAGE - GENERAL, SINGLE WYTHE MASONRY, and CAVITY WALL MASONRY

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.
B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
C. Place continuous joint reinforcement in first and second joint below top of walls.
D. Embed longitudinal wires of joint reinforcement in mortar joint with at least 5/8 inch mortar cover on each side.
E. Lap joint reinforcement ends minimum 6 inches.

3.07 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up flashing ends at least 1 inch, minimum, to form watertight pan at nonmasonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.
B. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.
C. Extend metal flashings through exterior face of masonry and terminate in an angled drip with hemmed edge. Install joint sealer below drip edge to prevent moisture migration under flashing.
D. Support flexible flashings across gaps and openings.

3.08 LINTELS

A. Install loose steel lintels over openings.

3.09 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.
B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

3.10 TOLERANCES

A. Install masonry within the site tolerances found in TMS 402/602.
B. Maximum Variation from Alignment of Columns: 1/4 inch.
C. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

3.11 CUTTING AND FITTING

A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.12 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

3.13 CLEANING

A. Clean soiled surfaces with cleaning solution.

3.14 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 05 5000 - METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Steel pipe bollards.

1.02 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).
B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.
E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
H. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
I. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
J. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).
K. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
L. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Plates: ASTM A283/A283M.
B. Pipe: ASTM A 53/A 53M Grade B Schedule 40, black finish.
C. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.
D. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.
B. Fabricate items with joints tightly fitted and secured.
C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
D. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.

2.04 FINISHES - STEEL

A. Prime paint steel items.
   1. Exceptions: Galvanize items to be embedded in concrete.
   2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
B. Prepare surfaces to be primed in accordance with SSPC-SP2.
C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
D. Prime Painting: One coat.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.
B. Furnish setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
C. Field weld components as indicated on drawings.
D. Perform field welding in accordance with AWS D1.1/D1.1M.
E. Obtain approval prior to site cutting or making adjustments not scheduled.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

PART 2 PRODUCTS

END OF SECTION

SECTION 05 7000 - DECORATIVE METAL RAILINGS

PART 1 GENERAL

1.01 Section Includes

A. Decorative metal units.

1.02 Reference Standards

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.

B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

D. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

E. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).

F. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

G. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2017.

1.03 Submittals

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's product data, including description of materials, components, finishes, fabrication details, anchors, and accessories.

C. Shop Drawings: Indicate elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, brazed connections, transitions, and terminations.

D. Test Reports: Submit test reports from independent testing agency showing compliance with specified design and performance requirements.

E. Executed warranty.

1.04 Quality Assurance

1.05 Delivery, Storage, and Handling

A. Deliver materials in factory-provided protective coverings and packaging.

B. Protect materials against damage during transit, delivery, storage, and installation at site.

C. Inspect materials for damage upon delivery. Replace damaged and unrepairable materials. Ensure replacement materials are indistinguishable from undamaged parts and finishes.

D. Prior to installation, store materials and components under cover in a dry location.

1.06 Field Conditions

A. Maintain ambient temperature of space at minimum 65 degrees F and maximum 95 degrees F for 24 hours before, during, and after installation.

1.07 Warranty

A. Manufacturer Warranty: Provide 2-year manufacturer warranty for defects in materials, fabrication, finishes, and installation. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 DECORATIVE METAL UNITs

2.02 MANUFACTURERS

A. Decorative Metal Railings:

1. Couturier Iron Craft, Inc: www.couturierironcraft.com/#sle.
2. C. R. Laurence Company, Inc: www.crl-arch.com/#sle.
3. Global Glass Railings; Hercules system (base mounted): www.architecturalglassrailings.com/#sle.
4. Superior Aluminum Products, Inc: www.superioraluminum.com/#sle.
5. Substitutions: See Section 01 6000 - Product Requirements.

2.03 RAILING SYSTEMS

A. Railing Systems - General: Factory- or shop-fabricated in design indicated, to suit specific project conditions, and for proper connection to building structure, and in largest practical sizes for delivery to site.

1. Performance Requirements: Design and fabricate railings and anchorages to resist the following loads without failure, damage, or permanent set; loads do not need to be applied simultaneously.
   a. Lateral Force: 75 lb minimum, at any point, when tested in accordance with ASTM E935.
   b. Distributed Load: 50 lb/ft minimum, applied in any direction at the top of the handrail, when tested in accordance with ASTM E935.
   c. Concentrated Loads on Intermediate Rails: 50 psf, minimum.
   d. Concentrated Load: 200 lbs minimum, applied in any direction at any point along the handrail system, when tested in accordance with ASTM E935.
   e. Handrails: Comply with applicable accessibility requirements of ADA Standards.
2. Assembly: Join lengths, seal open ends, and conceal exposed mounting bolts and nuts using slip-on non-weld mechanical fittings, flanges, escutcheons, and wall brackets.
3. Joints: Tightly fitted and secured, machined smooth with hairline seams.
4. Field Connections: Provide sleeves to accommodate site assembly and installation.
5. Welded and Brazed Joints: Make visible joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
   a. Ease exposed edges to a small uniform radius.
   b. Welded Joints:

1) Carbon Steel: Perform welding in accordance with AWS D1.1/D1.1M.
2) Stainless Steel: Perform welding in accordance with AWS D1.6/D1.6M.

c. Brass/Bronze Brazed Joints:
1) Perform torch brazing in accordance with AWS C3.4M/C3.4.
2) Perform induction brazing in accordance with AWS C3.5M/C 3.5.
3) Perform resistance brazing in accordance with AWS C3.9M/C3.9.

B. Metal Railing: Engineered, post-supported railing system with metal infill.
1. Configuration: as drawn.
2. Decorative Flanges for Embedded Posts: Circular, collared cover plate without screw holes.
3. Wall Mounted Components: Components necessary to support railing with 1-1/2 inch clearance from wall, and as follows:
4. Fasteners: Concealed.

2.04 Materials
A. General: Provide sheet metal without pitting, seam marks, roller marks, stains, discolorations, or other imperfections exposed to view on finished units.
B. Aluminum Components: ASTM B221 or ASTM B221M.

2.05 Accessories
A. Anchors and Fasteners: Provide anchors and other materials to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

PART 3 EXECUTION

3.01 Examination
A. Verify that substrate and site conditions are acceptable and ready to receive work.
B. Verify field dimensions of locations and areas to receive work.
C. Notify Architect immediately of conditions that would prevent satisfactory installation.
D. Do not proceed with work until detrimental conditions have been corrected.

3.02 Preparation
A. Protect existing work.
B. Clean surfaces to receive units. Remove materials and substances detrimental to installation.

3.03 Installation
A. Comply with manufacturer's drawings and written instructions.
B. Install components plumb and level, accurately fitted, free from distortion or defects, and with tight joints, except where necessary for expansion.
C. Anchor securely to structure.
D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
E. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.

3.04 Cleaning
A. Remove protective film from exposed metal surfaces.
B. Metal: Clean exposed metal finishes with potable water and mild detergent, in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents, or other substances that may damage the material or finish.

3.05 Protection
A. Protect installed components and finishes from damage after installation.
B. Repair damage to exposed finishes to be indistinguishable from undamaged areas.
1. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.

END OF SECTION

SECTION 06 1000 - ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.
B. Nonstructural dimension lumber framing.
C. Rough opening framing for doors, windows, and roof openings.
D. Roof-mounted curbs.
E. Miscellaneous framing and sheathing.
F. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS

A. Section 01 7610 - Temporary Protective Coverings.
B. Section 01 8113 - Sustainable Design Requirements.
C. Section 07 2500 - WEATHER BARRIERS AND FLEXIBLE FLASHING: Water-resistive barrier over sheathing.

1.03 REFERENCE STANDARDS

A. APA PRP-108 - Performance Standards and Qualification Policy for Structural-Use Panels (Form E445); 2001.
B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
D. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).
E. AWPA U1 - Use Category System: User Specification for Treated Wood; 2021.
F. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems; 2014, with Editorial Revision (2017).
G. PS 20 - American Softwood Lumber Standard; 2020.
H. SPIB (GR) - Grading Rules; 2014.
I. WWPA G-5 - Western Lumber Grading Rules; 2021.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Samples: For rough carpentry members that will be exposed to view, submit two samples, illustrating wood grain, color, and general appearance.
C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
    1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
    2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
    3. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Western Wood Products Association; WWPA G-5.
B. Sizes: Nominal sizes as indicated on drawings, S4S.
C. Moisture Content: S-dry or MC19.
D. Stud Framing (2 by 2 through 2 by 6):
    1. Species: Any allowed under referenced grading rules and meeting requirements stipulated on the drawings or elswhere in the project manual.
    2. Grade: No. 2.
E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
    1. Lumber: S4S, No. 2 or Standard Grade.
    2. Boards: Standard or No. 3.

2.03 EXPOSED DIMENSION LUMBER

A. Grading Agency: Western Wood Products Association; WWPA G-5.
B. Sizes: Nominal sizes as indicated on drawings.
C. Surfacing: S4S.
D. Moisture Content: S-dry or MC19.

2.04 ACCESSORIES

A. Fasteners and Anchors:
    1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
    1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.

C. Termite-Resistant Sill Plate Barrier: Self-adhesive, film-backed barrier with release sheet; adheres to concrete substrates and blocks termite access.
   1. Thickness: 68 mil, 0.068 inch.
   2. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.
D. Water-Resistive Barrier: See Section 07 2500.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
B. Preservative Treatment:
   1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
      b. Treat lumber exposed to weather.
      c. Treat lumber in contact with roofing, flashing, or waterproofing.
      d. Treat lumber in contact with masonry or concrete.

PART 3 EXECUTION

3.01 PREPARATION

A. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.
B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.
D. Schedule framing and allocate manpower so that exposure to inclement weather is minimized in duration to prevent damage to framing materials that may occur from prolonged exposure to moisture, snow or wind. If necessary provide temporary protective coverings - see Section 01 7610 and 01 7000.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated to support finishes, fixtures, specialty items, and trim.
B. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
C. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

3.04 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
B. Provide wood curb at each roof opening except where specifically indicated otherwise; form corners by alternating lapping side members.

3.05 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.
B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
C. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.06 CLEANING

A. Waste Disposal: See Section 01 7419 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.
B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.
C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 1753 - SHOP-FABRICATED WOOD TRUSSES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop-fabricated wood trusses.

B. Truss bridging.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Installation requirements for miscellaneous framing.

1.03 REFERENCE STANDARDS

A. ANSI/TPI 1 - National Design Standard for Metal-Plate-Connected Wood Truss Construction; 2014.

B. SBCA (BCSI) - Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses; 2018 (Updated 2020).

C. SPIB (GR) - Grading Rules; 2014.

D. TPI DSB-89 - Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses; 1989.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1. Review preparation and installation procedures and coordinating and scheduling required with related work.

2. **Coordinate floor truss layout with MEP systems and Architectural intent for exterior wall penatrations.**

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Show truss configurations, sizes, spacing, size and type of plate connectors, cambers, framed openings, bearing and anchor details, and bridging and bracing.

1. Include identification of engineering software used for design.

2. Provide shop drawings stamped or sealed by design engineer.

3. **Provide layout of floor trusses paying special attention to MEP system coordination and Architectural intent.**

4. **Indicate truss depth and spacing, bracing, bridging, and framed openings. Include wall locations and MEP penetrations for coordination purposes.**

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Perform design by or under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle trusses in accordance with SBCA (BCSI).

B. Store trusses in vertical position resting on bearing ends.

PART 2 PRODUCTS

2.01 TRUSSES

A. Wood Trusses: Design and fabricate trusses in accordance with ANSI/TPI 1 and to achieve specified design requirements indicated.

1. Structural Design: Comply with applicable code for structural loading criteria.

2. Floor Deflection: 1/360, maximum.

3. Roof Deflection: 1/240, maximum.

2.02 MATERIALS

A. Lumber:

1. Moisture Content: Between 7 and 9 percent.

2. Lumber fabricated from old growth timber is not permitted.

B. Truss Bridging: Type, size and spacing recommended by truss manufacturer.

2.03 ACCESSORIES

A. Wood Blocking, Bridging, Plates, and Miscellaneous Framing: Softwood lumber, any species, construction grade, 19 percent maximum and 7 percent minimum moisture content.

2.04 WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that supports and openings are ready to receive trusses.

3.02 PREPARATION

A. Coordinate placement of bearing items.

3.03 ERECTION

A. Install trusses in accordance with manufacturer's instructions, SBCA (BCSI); maintain a copy of applicable documents on site until installation is complete.

B. Set members level and plumb, in correct position.

C. Do not field-cut or alter structural members without approval of Architect.

D. Install permanent bridging and bracing.

E. Frame openings between trusses with lumber in accordance with Section 06 1000.

3.04 TOLERANCES

A. Framing Members: 1/2 inch maximum, from true position.

END OF SECTION

SECTION 06 2000 - FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood casings and moldings.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
B. Section 06 4100 - Architectural Wood Casework: Shop fabricated custom cabinet work.
C. Section 08 1433 - Stile and Rail Wood Doors.
D. Section 09 9113 - Exterior Painting: Painting of finish carpentry items.
E. Section 09 9123 - Interior Painting: Painting of finish carpentry items.
F. Section 12 3530 - Residential Casework: Shop fabricated cabinet work.

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
C. BHMA A156.9 - Cabinet Hardware; 2020.
D. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2016.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
C. Samples: Submit two samples of wood trim 6" long.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI (AWS) for Custom Grade.
B. Interior Woodwork Items: (see drawings for wood species and finish)
   1. Moldings, Bases, Casings, and Miscellaneous Trim
   2. All material shall be paint grade stock.

2.02 LUMBER MATERIALS

A. Species per drawings, smooth sawn, maximum moisture content of 6 percent; custom grade suitable for paint or transparent finish as indicated on the drawings. .
B. Interior Items: Moldings, bases, casings, chair rails, and miscellaneous trim.
   1. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI (AWS) for Custom Grade suitable for paint or transparent finish as scheduled.
   2. Species and Grade:
      a. Opaque finish items: Poplar; custom grade, 9% maximum moisture content, finger jointing allowed.
      b. Transparent finish items: Birch or Maple, see drawings.
   3. See drawings for locations and trim profiles.

2.03 SHEET MATERIALS

A. Hardwood Plywood: Face species white birch, rotary cut, book matched, medium density fiberboard core; HPVA HP-1 Front Face Grade AA Back Face Grade 1, glue type as recommended for application.

2.04 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.
B. Fasteners: Of size and type to suit application; concealed.
C. Concealed Joint Fasteners: Threaded steel.

2.05 ACCESSORIES

A. Lumber for Shimming and Blocking: Softwood lumber of _____ species.
B. Wood Filler: Solvent base, tinted to match surface finish color.
C. Adhesives: Do not use adhesives that contain urea formaldehyde.

2.06 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.
B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.
C. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long, except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.
D. For PVC items install in strict compliance with the manufacturer's instructions and requirements.

E. Set and secure materials and components in place, plumb and level.
F. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
G. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.

3.03 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

END OF SECTION

SECTION 06 4100 - ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Specially fabricated cabinet units.
- B. Hardware.

1.02 REFERENCE STANDARDS
- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- D. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2016.

1.03 SUBMITTALS
- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
- C. Product Data: Provide data for hardware accessories.

1.04 QUALITY ASSURANCE
- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
  - 1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.

1.05 MOCK-UPS
- A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware, finishes, and plumbing accessories.

1.06 DELIVERY, STORAGE, AND HANDLING
- A. Protect units from moisture damage.

1.07 FIELD CONDITIONS
- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 CABINETS
- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Wood Veneer Faced Cabinet:
  - 1. Exposed Surfaces: HPVA HP-1 Grade A, Maple, plain sliced, random-matched.
  - 2. Semi-Exposed Surfaces: HPVA HP-1 Grade B, Birch, plain sliced, random-matched.
  - 3. Concealed Surfaces: Manufacturer's option.
- C. Plastic Laminate Faced Cabinets: Custom grade.
- D. Cabinetsat Common Areas:
  - 1. Finish - Exposed Exterior Surfaces: Wood.
  - 2. Finish - Concealed Surfaces: Manufacturer's option.
  - 3. Casework Construction Type: Type B - Face-frame.
  - 4. Interface Style for Cabinet and Door: Style 1 - Overlay; Full Overlay.
  - 5. Cabinet Style: Flush overlay.
  - 6. Cabinet Doors and Drawer Fronts: Flush style.
  - 7. Drawer Side Construction: Multiple-dovetailed.
  - 8. Drawer Construction Technique: Dovetail joints.

2.02 WOOD-BASED COMPONENTS
- A. Wood fabricated from old growth timber is not permitted.

2.03 HARDWARE
- A. Adjustable Shelf Supports: Standard back-mounted system using surface mounted metal shelf standards and coordinated cantilevered shelf brackets, satin chrome finish, for nominal 1 inch spacing adjustments.
- B. Drawer and Door Pulls: Allison Amerock BP53003-G10.
- C. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish. Where shown on drawings.
- D. Drawer Slides:
  - 1. Type: Full extension.
  - 2. Static Load Capacity: Commercial grade.
  - 3. Mounting: Side mounted.
  - 4. Stops: Integral type.
  - 5. Features: Provide self closing/stay closed type.
  - 6. Manufacturers:
    - a. Accuride International, Inc: www.accuride.com/#sle.
    - b. Blum, Inc; MOVENTO: www.blum.com/#sle.
    - c. Hettich America, LP: www.hettich.com/#sle.
    - d. Knape & Vogt Manufacturing Company: www.knapeandvogt.com/#sle.
- E. Hinges: European style concealed self-closing type, steel with nickel-plated finish.
  - 1. Manufacturers:
    - a. Hardware Resources: www.hardwareresources.com/#sle.
    - b. Hettich America, LP: www.hettich.com/#sle.
    - c. Blum, Inc: www.blum.com/#sle.

d. Substitutions: See Section 01 6000 - Product Requirements.

2.04 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:

1. Provide center matched panels at each elevation.

2.05 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.

C. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.

D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:

1. Transparent:

a. System - 2, Lacquer, Precatalyzed.

b. Stain: As selected by Architect.

c. Sheen: Flat.

2. Opaque: (where indicated)

a. System - 2, Lacquer, Precatalyzed.

b. Color: As selected by Architect.

c. Sheen: Flat.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify field measurements.

3.02 INSTALLATION

A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

B. Use fixture attachments in concealed locations for wall mounted components.

C. Use concealed joint fasteners to align and secure adjoining cabinet units.

D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

E. Secure cabinets to floor using appropriate angles and anchorages.

F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 06 6000 - PLASTIC FABRICATIONS

PART I GENERAL

1.01 SECTION INCLUDES

A. Free-Foam Cellular PVC Trim Boards for corner boards, soffits, fascias, battens, door pilasters, frieze boards, rake boards, pilasters, water tables, architectural millwork and door/window trim.

1.02 RELATED SECTIONS

A. Section 06 64 00 – Plastic Paneling
B. Section 06 65 00 – Plastic Simulated Wood Trim
C. Section 06 66 00 – Custom Ornamental Simulated Woodwork

1.03 REFERENCES

A. ASTM D792 – Density and Specific Gravity of Plastics by Displacement.
B. ASTM D570 – Water Absorption of Plastics.
C. ASTM D638 – Tensile Properties of Plastics.
D. ASTM D790 – Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
E. ASTM D1761 – Mechanical Fasteners in Wood.
F. ASTM D5420 – Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by means of a Striker Impacted by a Falling Weight.
G. ASTM D256 – Determining the Pendulum Impact Resistance of Plastics.
H. ASTM D696 – Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30° C with a Vitreous Silica Dilatometer.
I. ASTM D635 – Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
J. ASTM E84 – Surface Burning Characteristics of Building Materials.
K. ASTM D648 – Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
L. ASTM D3679 – Standard Specification for Rigid Poly Vinyl Chloride (PVC) Siding.

1.04 SUBMITTALS

A. General: Present listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
B. Product Data: Submit product data, manufacture's catalog, Technical Bulletins, for specified products.
C. Samples: Submit three materials samples representative of the texture, thickness and widths shown and specified herein.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Check with Local Building Code for installation requirements.
B. Allowable Tolerances.
   1. Variation in component length: -0.00 / +1.00.
   2. Variation in component width: +/- 1/16".
   3. Variation in component thickness: +/- 1/16".
   4. Variation in component edge cut: +/- 2°.
   5. Variation in Density +/- 0.025 grams per cubic centimeter
C. Workmanship, Finish, and Appearance:
   1. Free Foam Cellular PVC that is homogeneous and free of voids, holes, cracks, foreign inclusions and other defects. Edges must be square and top and bottom surfaces shall be flat with no convex or concave deviation.
   2. Uniform surface free from cupping, warping, and twisting

1.06 DELIVERY, STORAGE AND HANDLING

A. Trim materials should be stored on a flat and level surface on a full shipping pallet. Handle materials to prevent damage to product edges and corners. Store materials under a protective covering to prevent jobsite dirt and residue from collecting on the boards.

1.07 WARRANTY

A. Provide manufacturer's 30 year transferable warranty against defects in manufacturing that causes the products to rot, corrode, delaminate, or excessively swell from moisture.

PART II PRODUCTS

2.01 MATERIALS

A. Acceptable products: PALIGHT TRIMBOARD manufactured by Palram Americas, Inc., 9735 Commerce Circle, Kutztown, PA 19530. Phone: 610-285-9918
B. Material: Free Foam Cellular PVC material with a small-cell microstructure and density of .55 -.60 grams/cm³.
   1. Material shall have a minimum physical and performance properties specified in the following Section C.
C. Performance and physical characteristic requirements:

Property	Conditions (U.S. Customary)	ASTM Method	Units - SI (U.S. Customary)	Value (U.S. Customary)
Physical				
Density		D-792	g/cm^3 (lb/ft^3)	0.55-0.60 (35)
Water Absorption	24 hr. @ 23°C	D-570	%	0.5
Mechanical				
Tensile strength at yield	10 mm/min (0.4 in./min)	D-638	MPa (psi)	15 (2,200)
Tensile strength at break	10 mm/min (0.4 in./min)	D-638	MPa (psi)	14.5 (2,100)
Elongation at yield	10 mm/min (0.4 in./min)	D-638	%	5
Elongation at break	10 mm/min (0.4 in./min)	D-638	%	40
Flexural Modulus	1.3 mm/min (0.05 in./min)	D-790	MPa (psi)	896 (130,000)
Flexural Strength at Yield	1.3 mm/min (0.05 in./min)	D-790	MPa (psi)	28 (4,000)
Hardness (Shore D)		Durometer	Shore D	52-58
Screw Hold	lbf/in of penetration	D-1761	lbf	600
Nail Hold	lbf/in of penetration	D-1761	lbf	90
Staple Hold	lbf/in of penetration	D-1761	lbf	69
Thermal				
Long Term Service Temperature			°C (°F)	-15 to 55 (14 to 131)
Heat Deflection Temperature	Load: 1.82 Mpa (264 psi)	D-648	°C (°F)	60 (140)
Coefficient of Linear Thermal Expansion		D-696	10^{-5}/°C (10^{-5}/°F)	6.7 (3.7)
Thermal Conductivity		C-177	W/m°K (Btu-in./hr-ft^2-°F)	.87 (0.5)
Electrical				
Surface Resistance	Ketley	D-257	Ohm	5×10^{15}
Volume Resistance	Ketley	D-257	Ohm-cm	2×10^{16}
Flammability				
Burning Rate		D-635	in/min	Failed to ignite
Flame Spread Index (FSI)		E-84		26 to 75 (Class B)

D. Deecorative Louver:
   1. **Basis of Design:** Fypon: www.fypon.com.
   2. First Class Building Products, Inc.; www.firstclassbp.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ACCESSORY PRODUCTS

A. FASTENERS:
   1. Use stainless steel fasteners designed for wood trim and siding for best results. Fastener should have sufficient flexural and tensile strength to resist bending.
   2. Fasteners with thin shanks, blunt points, and full round heads are preferred. The fastener must be long enough to penetrate the substrate a minimum of 1 1/2 inches.
   3. Do not use staples, small brads and wire nails. Avoid using finethreaded wood screws and ringshake fasteners.
   4. Use standard nail guns with a pressure setting between 70 psi and 100 psi. The recommended pressure depends on the type of gun, type of nail, ambient temperature, and the substrate. Care should be taken not to overdrive the nail into the material.
   5. Pre-drilling typically is not required unless large fasteners are used or the product is installed during low temperatures.
   6. Use two fasteners for every framing member for trimboard applications. Palight Trimboard Sheet and trimboards 8 inches and wider require additional fasteners.
   7. Install fasteners no more than 2 inches from the end of each board.
   8. Avoid fastening Palight Trimboard over hollow or uneven areas. Fasten Palight Trimboard onto flat, solid substrates.
   9. 3/8” and 1/2” thick Palight Trimboard Sheet and Beadboard are not designed to be ripped and used for trim applications. These products must be glued and mechanically fastened to the substrate.

B. ADHESIVES:
   1. All bonded surfaces must be smooth, clean, and in complete contact with each other for best results.
   2. For adhering Palight Trimboard to itself, bond joints with PVC cement or cellular PVC adhesives to prevent joint separation. Products such as Bond-and-Fill (2 component epoxy), IPS Weld-On 705 (white), and Genova Vinyl Adhesive are excellent cements.
   3. Remember that most PVC cements cure quickly (3-5 minutes), and have a limited working time.
   4. Scarf cut joints are recommended.
   5. Bonded joints should be secured with fasteners and fastened on each side of the joint.

6. When bonding Palight Trimboard to other substrates, consult the adhesive manufacturer to determine suitability.
7. If you have to butt joints, double nail the trimboards on both sides of the butt joint and reinforce with construction adhesive applied to the backside of the trimboards.

C. SEALANTS:
1. Use urethane, polyurethane, polymer blends or acrylic based sealants that do not contain silicone.

2.03 FINISHES - Palight Trimboard does not require painting for protection. If painting is preferred, follow these guidelines.

A. PREPARATION:
1. Be sure the Palight Trimboard surface to be painted is clean, dry, and free of dirt, loose or peeling paint, mildew, chalk, grease and any other surface contaminants before paint application.
2. Use 100% acrylic latex or 100% acrylic latex with urethane additive paint with a light reflective value equal to or greater than 55 units.
3. Follow the paint manufacturer's application recommendations.
4. Nail holes may be finished with a two component methacrylate, poly urethane, polymer, or acrylic based caulk, or painted over. Use a caulk that is UV resistant.

PART III EXECUTION

3.01 INSTALLATION - Manufacturer's instructions: Comply with manufacturer's installation instruction and product technical bulletins.

A. CUTTING:
1. Palight Trimboard can be cut using standard woodworking saws. Conventional carbide-tipped blades designed for cutting wood are preferred. Avoid using fine-tooth metal-cutting blades.
2. Rough-cut edges are typically caused by excessive friction, poor board support, or worn or improper tooling.

B. DRILLING:
1. Palight Trimboard can be drilled using standard woodworking drill bits. Do not use drill bits made for rigid PV
2. Avoid frictional heat build-up.
3. Remove shavings periodically from a drill hole as necessary.

C. ROUTING:
1. Palight Trimboard can be routed using standard woodworking router bits. Carbide-tipped router bits are preferred.
2. Routing Palight Trimboard provides a crisp, clean edge due to Palight Trimboard's consistent density.

D. MILLIING & MOULDING:
1. Palight Trimboard can be milled or moulded using standard milling or moulding machines found in millwork shops.
2. Rake angle 20 to 30 degrees. 25 degrees appears to work the best.
3. Cutting speed to be optimized with the number of knives and feed rate.

E. ROUTING:
1. Palight Trimboard can be routed with virtually any piece of equipment used to rout wood.
2. Carbide tipped router bits are recommended.
3. Machinery that allows for multiple cutting speeds will allow you to optimize the process obtaining a smoother finished part.

F. EDGE FINISHING:
1. Traditional sanding, grinding or filing tools used for woodworking are preferred.

G. NAIL LOCATION:
1. For trimboard applications, use 2 fasteners per framing member.
2. Additional fasteners are required for trimboard 8" and wider.
3. Fasteners must be installed a maximum of 2" from the end of each board.

H. EXPANSION AND CONTRACTION:
1. Palight Trimboard expands and contracts with changes in temperature. Properly fastening Palight Trimboard along its entire length will minimize expansion and contraction.
2. Allow 3/16-inch space per 18-foot run of Palight Trimboard for expansion and contraction.
3. Bond joints between pieces of Palight Trimboard to eliminate separation.
4. Allow expansion and contraction space at the ends of long runs.

I. CLEANING:
1. Palight Trimboard can be cleaned with mild detergent and water. Products with pumice, such as Soft Scrub® with Bleach, may be applied with an abrasive nylon brush. For more stubborn stains use a mild household cleaner and degreaser like Clorox® Cleanup or Clorox® Outdoors.

END OF SECTION

SECTION 06 7300 - COMPOSITE DECKING

PART 1 GENERAL

1.01 Section Includes
- A. Plastic composite decking.

1.02 Related Requirements
- A. Section 06 6100 - Rough Carpentry

1.03 Reference Standards
- A. ANSI/ACMA/PIC (CSP) - Code of Standard Practice, Industry Guidelines for Fabrication and Installation of Pultruded FRP Structures; 2011 (Reapproved 2012).
- B. ASTM D7032 - Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite and Plastic Lumber Deck Boards, Stair Treads, Guards, and Handrails; 2017.
- C. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 Adminstrative Requirements
- A. Preinstallation Meeting: Conduct preinstallation meeting one week prior to start of work of this section; require attendance by affected installers.

1.05 Submittals
- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's published product literature:
  1. Include sizes and profiles; structural design data.
- C. Samples: Submit two samples, 6" length, indicating specified texture and finish.

1.06 Mock-Ups
- A. Construct decking mock-up demonstrating aesthetic effects and workmanship.
- B. Mock-ups may remain as part of work.

1.07 Delivery, Storage, and Handling
- A. Deliver materials to project site in original, unbroken packages, or bundles bearing label of manufacturer and component identification markings.
- B. Protect decking units from damage including cracking or chipping.

1.08 Warranty
- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer's standard limited warranty for products. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 Plastic Composite Decking
- A. Manufacturers: Basis of design provide Trex Transcend Composite Decking (color selected by architect from manufacturer's full range) or comparable product by one of the following.
  1. AZEK Building Products: TimberTech AZEK Harves Collection
  2. Certainteed Corporation
  3. Tamko Building Products.
  4. Crawford Industries, LLC>
  5. Fiberon
  6. Midwest Manufacturing Extrusion.
  7. Premium Composites LLC.
  8. Weyerhaeuser Company
- B. Plastic Composite Decking: Extruded thermoplastic composite decking boards; for exterior applications where ICC (IBC) permits combustible construction; complying with ASTM D7032. Decking shall be solid capped four-sided shapes made from HDPE, PVC, polystyrene, or cellular PVC; with no cellulose fiber.
  1. Deck Board Size: 1 inch by 3-1/8 inches or 5-1/2 inches.
  2. Board Edges: Radiused.
  3. Board Side Profile: Slotted, to receive manufacturer's concealed fastener system.
  4. Finish: Manufacturer's standard finish; in compliance with specified slip resistance requirements.
  5. Color: To be selected by Architect from manufacturer's full range.
- C. Accessories:
  1. Manufacturer's concealed fasteners and anchorage devices.

PART 3 EXECUTION

3.01 Examination - General
- A. Verify dimensions, tolerances, and interfaces with related work; verify location of supporting assemblies.
- B. Verify support work has been constructed to allow accurate placement and alignment of anchor bolts and other connections to supporting assemblies.
- C. Verify substrates to determine that conditions are acceptable for installation of decking in accordance with manufacturer's written instructions.

3.02 Installation - General

3.03 Installation - Plastic Composite Decking
- A. Install decking in accordance with manufacturer's published instructions, subject to conditions of its evaluation report.

3.04 Tolerances
- A. Install decking complying with installation tolerances indicated in ANSI/ACMA/PIC (CSP).

3.05 Cleaning - FRP Composite Decking

3.06 Protection

A. Protect installed decking from subsequent construction operations.

END OF SECTION

SECTION 07 0150.19 - PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Replacement of existing roofing system in preparation for entire new roofing system.
B. Removal of existing flashing and counterflashings.
C. Temporary roofing protection.

1.02 RELATED REQUIREMENTS

A. Section 07 3113 - Asphalt Shingles.
B. Section 07 6200 - Sheet Metal Flashing and Trim: Replacement of flashing and counterflashings.
C. Section 07 7100 - Roof Specialties: Fascias and soffits.
D. Section 07 7123 - Manufactured Gutters and Downspouts.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with affected mechanical and electrical work associated with roof penetrations.
B. Schedule work to coincide with commencement of installation of new roofing system.

1.04 QUALITY ASSURANCE

A. Materials Removal Company Qualifications: Company specializing in performing work of type specified with at least three years of documented experience.

1.05 FIELD CONDITIONS

A. Existing Roofing System: Asphalt shingle roofing.
B. Do not remove existing roofing membrane when weather conditions threaten the integrity of building contents or intended continued occupancy.
C. Maintain continuous temporary protection prior to and during installation of new roofing system.
D. Provide notice at least three days before starting activities that will affect normal building operations.
E. Owner will occupy building areas directly below re-roofing area.
    1. Provide Owner with at least 48 hours written notice of roofing activities that may affect their operations and to allow them to prepare for upcoming activities as necessary.
    2. Do not disrupt Owner's operations or activities.

PART 2 PRODUCTS

2.01 COMPONENTS

A. Refer to following sections for additional information on components relating to this work:
    1. Replacement and removal of existing roofing system in preparation for entire new roofing system, refer to Section 07 3113 - Asphalt Shingles.
    2. Remove existing flashing and counterflashings in preparation for replacement of these materials as part of this work, refer to Section 07 6200 for material requirements.

2.02 MATERIALS

A. Temporary Roofing Protection Materials:
    1. Contractor's responsibility to select appropriate materials for temporary protection of roofing areas as determined necessary for this work.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing roof surface has been cleared of materials being removed from existing roofing system and ready for next phase of work as required.

3.02 PREPARATION

A. Sweep roof surface clean of loose matter.
B. Remove loose refuse and dispose of properly off-site.

3.03 MATERIAL REMOVAL

A. Remove only existing roofing materials that can be replaced with new materials the same day.
B. Remove metal counter flashings.

3.04 INSTALLATION

A. Coordinate scope of this work with requirements for installation of new roofing system, refer to Section 07 3113 - Asphalt Shingles for additional requirements.

3.05 PROTECTION

A. Provide temporary protective sheeting over uncovered deck surfaces.
B. Do not permit traffic over unprotected or repaired deck surface.

END OF SECTION

SECTION 07 2100 - THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at over roof sheathing.

1.02 RELATED REQUIREMENTS

A. Section 07 2700 - Air Barriers: Separate air barrier materials.

1.03 REFERENCE STANDARDS

A. ASTM C240 - Standard Test Methods for Testing Cellular Glass Insulation Block; 2021.
B. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
C. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation; 2021a.
D. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013 (Reapproved 2019).
E. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2019.
F. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).
G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
H. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2019.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

1.05 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation over Roof Deck: Extruded polystyrene (XPS) board.

2.02 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene (XPS) Board Insulation: Comply with ASTM C578 with either natural skin or cut cell surfaces.
   1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
   2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88), minimum, per 1 inch thickness at 75 degrees F mean temperature.
   5. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
   6. Board Thickness: As indicated in the drawings.
   7. Products:
      a. DuPont de Nemours, Inc; Styrofoam Brand Square Edge: building.dupont.com.
      b. Owens Corning Corp: www.owenscorning.com.
      c. Kingspan Insulation LLC; GreenGuard XPS Type IV, 25 psi ; GreenGuard XPS Type IV, 25 psi: www.kingspan.com.
      d. **Basis of Design:** Owens Corning Corporation; FOAMULAR Type Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com.
      e. Substitutions: See Section 01 6000 - Product Requirements.

2.03 ACCESSORIES

A. Flashing Tape: Special polyolefin film with high performance adhesive or type as recommended by manufacturer.
   1. Width: As required for application and by manufacturer. Are required for application
B. Joint Tape: Specified self-adhering type, or manufacturer's recommended tape of required width for application.
C. Insulation Fasteners: Lengths of unfinished, 13-gauge, 0.072-inch high carbon spring steel with chisel or mitered tips, held in place by tension, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
D. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
E. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.
F. Adhesive: Type recommended by insulation manufacturer for application.
G. Spray foam insulation: Non-expanded foam spray for application into cracks around exterior doors and windows, closely spaced framing members, holes, annular space at wall penetrations without firestopping, between hvac duct boots and cut openings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 GENERAL

A. Provide complete insulation package for proposed structure including foundation, walls, floors, attics and any assembly exposed to the exterior.
B. Insulate all crevices at exterior openings and penetrations either with batt insulation or non expanding foam.
C. Fill all holes in top and bottom wall plates of attics and crawl spaces with nonexpanding foam.
D. Place insulation under slabs on grade after base for slab has been compacted.
E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
F. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

3.04 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 2126 - BLOWN INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Attic: Blown insulation pneumatically placed into joist spaces through access holes.

1.02 REFERENCE STANDARDS

A. ASTM C739 - Standard Specification for Cellulosic Fiber Loose-Fill Thermal Insulation; 2021a.

B. ASTM C1015 - Standard Practice for Installation of Cellulosic and Mineral Fiber Loose-Fill Thermal Insulation; 2017.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and limitations.

C. Manufacturer's Installation Instructions: Indicate procedure for preparation and installation.

1.04 **WARRANTY**

A. Provide guarantee that attic insulation depth will remain minimum dimension for specified R-value for one year.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Blown Insulation:

1. CertainTeed Corporation: www.certainteed.com.
2. GreenFiber: www.greenfiber.com.
3. Johns Manville: www.jm.com.
4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Applications: Provide blown insulation in attic as indicated on drawings.

B. Loose Fill Insulation: ASTM C739, cellulose fiber type, bulk for pneumatic placement.

1. Thermal Transmittance (U-value): 0.27 BTU/hr sq ft deg F, maximum.
2. Installed Thickness: As indicated on drawings to achieve required R Value indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate and adjacent materials are dry and ready to receive insulation.

B. Verify that light fixtures have thermal cut-out device to restrict over-heating in soffit or ceiling spaces.

C. Verify spaces are unobstructed to allow for proper placement of insulation.

3.02 INSTALLATION

A. Install insulation in accordance with ASTM C1015 and manufacturer's instructions.

B. Completely fill intended spaces leaving no gaps or voids.

C. Repair and reseal insulation access ports, and refinish to match adjacent work.

3.03 CLEANING

A. Remove loose insulation residue.

END OF SECTION

SECTION 07 2500 - WEATHER BARRIERS AND FLEXIBLE FLASHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water-resistive barriers.

B. Vapor Retarders: Materials to make exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls water vapor resistant and air tight.

1.02 DEFINITIONS

A. Weather Barriers: Materials or assemblies forming water-resistive barriers, air barriers, vapor retarders, or combination of one or more assemblies.

B. Water-Resistive Barriers: Materials or assemblies installed behind exterior wall coverings; designed to prevent liquid water from further penetration into exterior wall assembly.

1.03 REFERENCE STANDARDS

A. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.

C. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2021.

D. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers; 2016, with Editorial Revision (2019).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on material characteristics.

C. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

1.05 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at project site.

B. Meet with Owner, Architect, Manufacturer's Certified Installer, weather barrier manufacturer's designated field representative, and installers of work that interfaces with or affects weather barrier.

C. Review methods and procedures related to weather barrier installation, including manufacturer's written instructions.

D. Review and finalize construction, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

E. Examine substrate conditions and finishes for compliance with requirements.

F. Review flashings, special weather barrier details, weather barrier penetrations, and condition of other construction that affects weather barrier.

G. Review weather barrier manufacturer's Project Registration and Observation process.

1.06 QUALITY ASSURANCE

A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:

1. Installer Qualification: Use ABAA accredited contractor, certified installers, evaluated materials and third-party field quality control audit.

2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacturing, and use secondary materials approved inwriting by primary material manufacturer.

1.07 MOCK-UPS

A. Install mock up using approved weather barrier assembly including fasteners, tape, and related accessories per manufacturer's current instructions. Mock up size to be an 8' wide section of wall full height of buidling.

B. Mock shall be approved by weather barrier manufacturer's field representative before proceeding with remaining work.

C. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

D. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.08 SPECIAL BUILDING ENCLOSURE WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Manufacturer's Field Service: Register Project with weather barrier manufacturer prior to installation of weather barrier and comply with weather barrier manufacturer's Project registration and observation process.

C. Installation Warranty for Building Weather Barrier and Rainscreen Assembly: Installer of exterior weather barrier and rainscreen assembly (including air/vapor barrier and attachments, framing, and exterior panels) to provide 10-year warranty that includes coverage for defective materials and/or workmanship. This warranty will also clearly include materials, labor, necessary activity to access these areas, and removal of any materials to effect repairs and restore to watertight conditions. www.edacontractors.com/#sle

PART 2 PRODUCTS

2.01 WEATHER BARRIER ASSEMBLIES

A. Air Barrier:

1. On outside surface of inside wythe of exterior masonry cavity walls use air barrier sheet, mechanically fastened type.

2. On outside surface of sheathing of exterior walls use air barrier sheet, mechanically fastened type.

B. Interior Vapor Retarder:

1. On inside face of studs of exterior walls, under cladding, use mechanically fastened vapor retarder sheet.

2.02 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)

A. Air Barrier Sheet, Mechanically Fastened:

1. Air Penetration Resistance, .001 cfm/sq. ft. @ 75 Pa, when tested in accordance with ASTM E2178,
2. Water Vapor Permeance: 28 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant procedure).
3. Water Penetration Resistance: 280 cm. when tested per AATCC 127.
4. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 270 days of weather exposure.
5. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 50 or less, when tested in accordance with ASTM E84.
6. Water Resistance: Comply with applicable water-resistive requirements of ICC-ES AC38.
7. Seam and Perimeter Tape: Polyethylene self adhering type, mesh reinforced, 2 inches wide, compatible with sheet material; unless otherwise specified.
8. Manufacturers:
   a. DuPont Building Innovations; Tyvek Commercial Wrap with FlexWrap NF, StraightFlash, StraightFlash VF, Tyvek Wrap Caps, and Tyvek Tape: www.dupont.com.
   b. Fortifiber Building Systems Group; WeatherSmart Drainable: www.fortifiber.com/#sle.
   c. National Shelter Products, Inc; DRYLine HP: www.drylinewrap.com/#sle.
   d. VaproShield, LLC; Wrapshield SA Self-Adhered WRB/ Air Barrier System complete with; WrapShield IT - Integrated Tape: www.vaproshield.com/#sle.
   e. REX Wrap Fortis Commercial Wrap by AlphaProTech, www.alphaprotech.com.
   f. Substitutions: See Section 01 6000 - Product Requirements.

2.03 **INTERIOR VAPOR RETARDER MATERIALS (AIR BARRIER AND WATER-RESISTIVE)**

A. Interior Vapor Retarder Sheet: Type: Dynamic permeability sheeting.
1. Thickness: 40 mil, 0.040 inch, nominal.
2. Water Vapor Permeance: dynamic ranging from 1.0 to 10 perms varying with prevailing relative humidity levels; when tested in accordance with ASTM E96/E96M.
3. Fire resistance: Class A, max smoke development 85, meeting ASTM E84.
4. Seam and Perimeter Tape: As recommended by sheet manufacturer.
5. Manufacturers:
   a. Membrain as manufactured by Certainteed Saint-Gobain.
   b. Intello Plus as provided by 475 High Performance Building Supply.

2.04 SEALANTS

A. Butyl Sealant: as specified in Section 07 9005 .

2.05 ADHESIVES

A. Mastic Adhesive : Compatible with sheet seal and substrate, thick mastic of uniform knife grade consistency.

2.06 Accessories

A. Sealants, Tapes, Adhesives and Accessories for Sealing Weather Barrier and Sealing Weather Barrier to Adjacent Substrates: As specified or as recommended by weather barrier manufacturer.
B. Manufacturer's fasteners recommended for specified product and substrate and as required to obtain warranty.
C. Flexible Flashing: Self-adhering sheet flashing complying with ASTM D1970/D1970M; waive slip resistance requirement if not installed on roof.
1. Width: 3 inches.
2. Products:
   a. DuPont de Nemours, Inc; FlexWrap: www.dupont.com/building/#sle.
   b. DuPont de Nemours, Inc; StraightFlash: www.dupont.com/building/#sle.
   c. DuPont de Nemours, Inc; VersaFlange: www.dupont.com/building/#sle.
   d. Substitutions: See Section 01 6000 - Product Requirements.

D. Threshold Flashing: Closed-cell foam tape with rubberized adhesive membrane; seals subfloor under threshold.
1. Width: 5-1/2 inches.
2. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 30 days of weather exposure.

E. Penetrations flashing: Quickflash Part #P-300 in appropriate size for round and rectangular wall penetrations. Use at plumbing, electrical, mechanical item exterior wall penetrations.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions comply with requirements of this section.

3.02 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

3.03 INSTALLATION

A. Install materials in accordance with manufacturer's installation instructions.
B. Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
1. All seams, tears or punctures shall be taped.
2. Seal top and botom of vapor retarder with continuous bead of sealant.

C. Apply sealants within recommended temperature range in accordance with manufacturer's installation instructions.
D. Mechanically Fastened Sheets:
1. Install sheets in shingle fashion to shed water; align horizontally.
2. Overlap seams as recommended by manufacturer, 6 inches, minimum.
3. Overlap at outside and inside corners as recommended by manufacturer, 12 inches, minimum.

4. For applications indicated to be airtight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners as recommended by manufacturer.
5. Install water-resistive barrier over jamb flashings.
6. Install head flashings under water-resistive barrier.
7. At framed openings with frames having nailing flanges, extend sheet into opening and over flanges; at head of opening, seal sheet over flange and flashing.

E. Self-Adhered Sheets:
1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.
2. Lap sheets shingle-fashion to shed water and seal laps airtight.
3. Upon placement of sheets, firmly press onto substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
4. Use same material, or other material approved by sheet manufacturer, to seal sheets to adjacent substrates, and as flashing.
5. At expansion joints, provide transition to joint assemblies approved by sheet manufacturer.

F. Openings and Penetrations in Exterior Water-Resistive Barriers:
1. Install flashing over sills, covering entire sill framing member, and extend at least 5 inches onto water-resistive barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
2. At openings filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
3. At openings filled with nonflanged frames, seal water-resistive barrier to each side of framing at opening using flashing at least 9 inches wide, and covering entire depth of framing.
4. At head of openings, install flashing under water-resistive barrier extending at least 2 inches beyond face of jambs; seal water-resistive barrier to flashing.
5. At interior face of openings, seal gaps between window and door frames and rough framing using appropriate joint sealant over backer rod.
6. Service and Other Penetrations: Form flashing around penetrating items and seal to surface of water-resistive barrier.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Coordination ofo ABAA Tests and Inspections:
1. Provide testing and inspections required by ABAA Quality Assurance Program.
2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
3. Cooperate and coordinate work with ABAA testing agency.
4. Do not cover installed water-resistive barriers until required inspections have been completed.
5. Obtain approval of installation procedures from water-resistive barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.
6. Take digital photographs of each portion of installation prior to covering up weather barriers.

3.05 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

SECTION 07 3113 - ASPHALT SHINGLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Asphalt shingle roofing.
B. Flexible sheet membranes for eave protection, underlayment, and valley protection.
C. Flashing.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Roof sheathing.
B. Section 07 6200 - Sheet Metal Flashing and Trim: Edge and cap flashings.

1.03 REFERENCE STANDARDS

A. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.
B. ASTM D3161/D3161M - Standard Test Method for Wind-Resistance of Steep Slope Roofing Products (Fan-Induced Method); 2014.
C. ASTM D3462/D3462M - Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules; 2010a.
D. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).
E. ASTM D7158/D7158M - Standard Test Method for Wind Resistance of Asphalt Shingles (Uplift Force/Uplift Resistance Method); 2017.
F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2021.
G. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2011.
H. ASTM F1667/F1667M - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples; 2021a.
I. ICC-ES AC188 - Acceptance Criteria for Roof Underlayments; 2012.
J. NRCA (RM) - The NRCA Roofing Manual; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data indicating material characteristics, performance criteria, and limitations.
C. Shop Drawings: For metal flashings, indicate specially configured metal flashings, jointing methods and locations, fastening methods and locations, and installation details.
D. Samples: Submit two samples of each shingle color indicating color range and finish texture/pattern ; for color selection.
E. Manufacturer's Installation Instructions: Indicate installation criteria and procedures.
F. Warranty: Provide copy of shingle warranty.
G. Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer at or before Substantial Completion.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacture of roofing systems similar to those required for this project, with not less than 5 years of documented experience.
B. Installer Qualifications: Company specializing in installing asphalt shingles, with at least 3 years of documented experience.

1.06 FIELD CONDITIONS

A. Do not install shingles, eave protection membrane or underlayment when surface, ambient air, or wind chill temperatures are below 45 degrees F.

1.07 ATTIC STOCK

A. Deliver extra materials to the owner matching products installed packaged with protective covering for storage and identified with lavels clearly describing contents. Furnish quantity of full-size asphalt shingles equalt to two (2%) percent of amount installed.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
B. Provide 30 years manufacturer's limited transferable warranty.
C. 15 year 110 mph wind resistance warranty.
D. 10 year warranty 100% replacement and labor costs due to manufacturing defects.
E. 10 year warranty against streaking and discoloration caused by airborne algae.
F. The roofing subcontractor shall warrant the workmansip for the entire roof system for a period of one (1) full year beyond the date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. **Basis-of-Design Product**: Subject to compliance with requirements, provide GAF Timberline HDZ Shingles with StainGuard Plus or comparable product by one of the following:
   1. GAF: www.gaf.com.
   2. IKO Industries Inc: www.iko.com.
   3. Owens Corning Corp: www.owenscorning.com.
   4. IKO: www.iko.com.
   5. Certainteed: www.certainteed.com.
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ASPHALT SHINGLES

A. Asphalt Shingles: Asphalt-coated glass felt, mineral granule surfaced, complying with ASTM D3462/D3462M, architectural dimensional shingles.
   1. Fire Resistance: Class A, complying with ASTM E108.
   2. Wind Resistance: Class A, when tested in accordance with ASTM D3161/D3161M.
   3. Warranted Wind Speed: Not greater than 150 mph.
   4. Weight: minimum 250 lb/100 sq ft.
   5. Self-sealing type.
   6. Style: Square.

2.03 SHEET MATERIALS

A. Eave and Valley Protection Membrane: Self-adhering polymer-modified asphalt sheet complying with ASTM D1970/D1970M; 40 mil total thickness; with strippable treated release paper and polyethylene sheet top surface.
   1. Manufacturers: W.R. Grace Construction Products, "Ice and Water Shield" or approved equivalent.

B. Underlayment: Synthetic non-asphaltic sheet, intended by manufacturer for mechanically fastened roofing underlayment without sealed seams.
   1. Type: Woven polypropylene with anti-slip polyolefin coating on both sides.
   2. Minimum Requirements: Comply with requirements of ICC-ES AC188 for non-self-adhesive sheet.
   3. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.
   4. Flammability: Minimum of Class A, when tested in accordance with ASTM E108.
   5. Ultraviolet (UV) Resistance and Weatherability: Approved in writing by manufacturer for exposure to weather for minimum of six months.
   6. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.
   7. Water Vapor Permeance: Vapor retarder; maximum of 0.1 perm, when tested in accordance with ASTM E96/E96M Procedure A, desiccant method.
   8. Fasteners: As recommended by manufacturer or building code qualification report or approval.

C. Underlayment: Asphalt-saturated organic roofing felt, unperforated, complying with ASTM D226/D226M, Type II ("No.30").

2.04 ACCESSORIES

A. Roofing Nails: Standard round wire shingle type, galvanized steel, stainless steel, aluminum roofing nails, or copper roofing nails, minimum 3/8-inch head diameter, 12-gauge, 0.109-inch nail shank diameter, 1-1/2 inches long and complying with ASTM F1667/F1667M.

B. Nails: Standard round wire shingle type, of hot-dipped zinc coated steel, 10 wire gage, 0.1019 inch shank diameter, 3/8 inch head diameter, of sufficient length to penetrate through roof sheathing or 3/4 inch into roof sheathing or decking.
   1. Staples are not permitted to be used.

C. Asphalt Roof Cement: ASTM D4586/D4586M, asbestos-free.

D. Ridge Vents: Shall be type which can be shingled over providing 18 square inches of ventilation per lineal foot.
   1. Products:
      a. **Basis of Design:** GAF: Cobra Rigid Vent 3; www.gaf.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 METAL FLASHINGS

A. Metal Flashings: Provide sheet metal eave edge, gable edge, ridge vents, valley flashing, and other flashing indicated.
   1. Form flashings to profiles indicated on Drawings.
   2. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

B. Aluminum Sheet Metal: Prefinished aluminum, 16 gage, 0.032 inch minimum thickness; PVC coating, color as selected by Architect.

PART 3 EXECUTION

3.01 REMOVAL OF EXISTING ROOF

A. Provide protection around building permeter for landscaping, yard, sidewalks etc. to protect from damage of existing roof removal process.

B. Remove existing shingles, underlayment, flashings and all fasteners down to existing roof decking.

C. Provide allowance to remove and replace 15% of existing roof decking.

D. Upon removal of materials, immediately place into dumpster or trash container. Clean site area daily.

3.02 EXAMINATION

A. Verify existing conditions prior to starting this work.

B. Verify roof deck is of sufficient thickness to accept fasteners.

C. Verify roof penetrations and plumbing stacks are in place and flashed to deck surface.

D. Verify roof openings are correctly framed.

E. Verify deck surfaces are dry, free of ridges, warps, or voids.

3.03 PREPARATION

A. Seal roof deck joints wider than 1/16 inch as recommended by shingle manufacturer.

B. At areas where eave protection membrane is to be adhered to substrate, fill knot holes and surface cracks with latex filler.

C. Broom clean deck surfaces before installing underlayment or eave protection.

D. Protect surrounding areas and adjacent surfaces from damage during execution of this work.

E. Install eave edge flashings tight with fascia boards. Weather lap joints 2 inches and seal with plastic cement. Secure flange with nails.

3.04 INSTALLATION

A. Eave Protection Membrane:
   1. Install eave protection membrane from eave edge to minimum 24 inches up-slope beyond interior face of exterior wall.

B. Valley Protection:
   1. Install one ply of smooth surfaced roll roofing, minimum 18 inches wide, centered over valleys.
   2. Install flexible flashing in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
   3. Weather lap joints minimum 2 inches.
   4. Nail in place minimum 18 inches on center, 1 inch from edges.

C. Metal Flashing:
   1. Weather lap joints minimum 2 inches and seal weather tight with plastic cement.
   2. Secure in place with nails and conceal fastenings. Follow manufacturer's specific instructions for spacing.
   3. Items Projecting Through or Mounted on Roofing: Flash and seal weather tight with plastic cement.

D. Shingles:
   1. Install shingles in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
      a. Fasten individual shingles using two nails per shingle, or as required by manufacturer and local building code, whichever is greater.
      b. Fasten strip shingles using four nails per strip, or as required by manufacturer and local building code, whichever is greater.
   2. Place shingles in straight coursing pattern with 5-inch weather exposure to produce double thickness over full roof area, and provide double course of shingles at eaves.
   3. Project first course of shingles 3/4 inch beyond fascia boards.
   4. Extend shingles 1/2 inch beyond face of gable edge fascia boards.
   5. Extend shingles on both slopes across valley in a weave pattern and fasten; extend shingles a minimum of 12 inches beyond valley center line to achieve woven valley, concealing valley protection.
   6. Complete installation to provide weathertight service.

3.05 CLEANING

A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.

B. Clean exposed work upon completion of installation; remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to finish.

3.06 PROTECTION

A. Do not permit traffic over finished roof surface; protect roofing until completion of project.

END OF SECTION

SECTION 07 4646 - FIBER-CEMENT SIDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiber-cement siding.

1.02 RELATED REQUIREMENTS

A. Section 07 2500 - WEATHER BARRIERS AND FLEXIBLE FLASHING: Weather barrier under siding.
B. Section 07 9200 - Joint Sealants: Sealing joints between siding and adjacent construction and fixtures.
C. Section 09 9113 - Exterior Painting: Field painting.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's data sheets on each product to be used, including:
   1. Manufacturer's requirements for related materials to be installed by others.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods, including nail patterns.
B. Installer's Qualification Statement.
C. Warranty: Submit copy of manufacturer’s warranty, made out in Owner’s name, showing that it has been registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified in this section with minimum three years of experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products under waterproof cover and elevated above grade, on a flat surface.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 FIBER-CEMENT SIDING

A. Lap Siding: Individual horizontal boards made of cement and cellulose fiber formed under high pressure with integral surface texture, complying to ASTM C1186, Type A, Grade II; with machined edges, for nail attachment.
   1. Style: Standard lap style.
   2. Texture: Smooth.
   3. Length: 12 ft, nominal.
   4. Width (Height): 5-1/4 inches.
   5. Thickness: 5/16 inch, nominal.
   6. Finish: Factory applied primer with two (2) coats, then field-painted.
   7. Color: Selected by architect from manufacturer's full range of colors..
   8. Warranty: 30 year limited; .
   9. Manufacturers:
      a. CertainTeed Corporation : www.certainteed.com.
      b. **Basis of Design:** James Hardie Building Products, Inc; Plank Lap Siding: www.jameshardie.com.
      c. Nichiha USA, Inc: www.nichiha.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ACCESSORIES

A. Trim: Same material and texture as siding.
B. Fasteners: Galvanized or corrosion resistant; length as required to penetrate minimum 1-1/4 inch.
C. Joint Sealer: As specified in Section 07 9200 - Joint Sealants.
D. Finish Paint: Latex house paint acceptable to siding manufacturer; primer recommended by paint manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrate, clean and repair as required to eliminate conditions that would be detrimental to proper installation.
B. Verify that weather barrier has been installed over substrate completely and correctly.
C. Do not begin until unacceptable conditions have been corrected.
D. If substrate preparation is responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Install Sheet Metal Flashing:
   1. Above door and window trim and casings.
   2. Above horizontal trim in field of siding.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions and recommendations.
   1. Read warranty and comply with terms necessary to maintain warranty coverage.
   2. Use trim details indicated on drawings.
   3. Touch up field cut edges before installing.
   4. Pre-drill nail holes if necessary to prevent breakage.
B. Over Wood and Wood-Composite Sheathing: Fasten siding through sheathing into studs.
C. Allow space for thermal movement between both ends of siding panels that butt against trim; seal joint between panel and trim with specified sealant.

D. Do not install siding less than 4 inches from surface of ground nor closer than 1 inch to roofs, patios, porches, and other surfaces where water may collect.
E. After installation, seal joints except lap joints of lap siding; seal around penetrations, and paint exposed cut edges.
F. Finish Painting: Within one week after installation, paint siding and trim with one coat primer and two coats finish paint.

3.04 PROTECTION

A. Protect installed products until Date of Substantial Completion.
B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 07 5323 - EPDM THERMOSET SINGLE-PLY ROOFING - CARLISLE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Adhered roof system with ethylene propylene diene monomer (EPDM) roofing membrane.

B. Insulation, flat and tapered.

1.02 REFERENCE STANDARDS

A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2021.

B. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015, with Editorial Revision (2022).

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Warranty:

1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum twenty (20) years of documented experience.

B. Installer Qualifications: Company specializing in performing work of this section:

1. Approved by membrane manufacturer.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within 10 years after installation.

C. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.

1. Warranty Term: 20 years.
2. For repair and replacement include costs of both material and labor in warranty.
3. Include damage caused by 2 inch maximum diameter hail.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Carlisle SynTec Systems: www.carlisle-syntec.com.

2.02 ROOFING APPLICATIONS

A. EPDM Membrane Roofing: One ply membrane, ballasted, over insulation.

B. Roofing Assembly Performance Requirements and Design Criteria:

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane:

1. Material: Ethylene propylene diene monomer (EPDM); ASTM D4637/D4637M, Type I (non-reinforced).
2. Thickness: 60 mil, 0.060 inch, minimum.
3. Sheet Width: Factory fabricated into largest sheets possible.
4. Color: Black.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Flexible Flashing Material: Same material as membrane.

D. Base Flashing: Provide waterproof, fully adhered base flashing system at all penetrations, plane transitions, and terminations.

2.04 INSULATION

A. Polyisocyanurate (ISO) Board Insulation: ASTM C1289, Type II, Class 1 - Faced with glass fiber reinforced cellulosic felt facers on both major surfaces of the core foam; Grade 1.

2.05 ACCESSORIES

A. Prefabricated Flashing Accessories:

1. Corners and Seams: Same material as membrane, in manufacturer's standard thicknesses.
2. Penetrations: Same material as membrane, with manufacturer's standard cut-outs, rigid inserts, clamping rings, and flanges.
3. Sealant Pockets: Same material as membrane, with manufacturer's standard accessories, in manufacturer's standard configuration.
4. Carlisle SynTec Systems; Sure-Seal Pressure-Sensitive Reinforced Universal Securement Strip (RUSS):

B. Membrane Adhesive: As recommended by membrane manufacturer.

C. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.

D. Sealants: As recommended by membrane manufacturer.

E. Cleaner: Manufacturer's standard, clear, solvent-based cleaner.

F. Edgings and Terminations: Manufacturer's standard edge and termination accessories.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.
E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 PREPARATION, GENERAL

A. Clean substrate thoroughly prior to roof application.
B. Do not begin work until other work that requires foot or equipment traffic on roof is complete.
C. Apply manufacturer's recommended vapor retarder or temporary roof before roof installation.

3.03 WOOD DECK PREPARATION

A. Verify flatness and tightness of joints of wood decking. Verify that all wood decking edges are fully supported. Fill knot holes with latex filler or completely cover with securely nailed sheet metal.

3.04 INSTALLATION - GENERAL

A. Perform work in accordance with manufacturer's instructions.
B. Do not apply roofing membrane during unsuitable weather.
C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

3.05 INSULATION APPLICATION

A. Lay subsequent layers of insulation with joints staggered minimum 6 inches from joints of preceding layer.
B. Lay boards with edges in moderate contact without forcing, and gap between boards no greater than 1/4 inch. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
C. Do not apply more insulation than can be completely waterproofed in the same day.

3.06 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
B. Shingle joints on sloped substrate in direction of drainage.
C. Fully Adhered Application: Apply adhesive at manufacturer's recommended rate. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof.
E. At intersections with vertical surfaces:
    1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
    2. Fully adhere flexible flashing over membrane and up to nailing strips.
F. Coordinate installation of roof drains and sumps and related flashings, locate field splices away from low areas and roof drains, and lap upslope sheet over downslope sheet.
G. Daily Seal: Install daily seal per manufacturer's instructions at the end of each workday. Prevent infiltration of water at incomplete flashings, terminations, and at unfinished membrane edges.

3.07 CLEANING

A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
B. Remove wrappings, empty containers, paper, and other debris from the roof daily. Dispose of debris in compliance with local, State, and Federal regulations.
C. Remove bituminous markings from finished surfaces.
D. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
E. Repair or replace defaced or damaged finishes caused by work of this section.

3.08 PROTECTION

A. Protect installed roofing and flashings from construction operations.
B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 5423 - THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING - CARLISLE

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Adhered system with thermoplastic polyolefin (TPO) roofing membrane.
- B. Insulation, flat and tapered.

1.02 REFERENCE STANDARDS
- A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2021.
- B. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; 2013.
- C. NRCA (RM) - The NRCA Roofing Manual; 2017.

1.03 SUBMITTALS
- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Warranty:
  1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
  2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

1.04 QUALITY ASSURANCE
- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum twenty (20) years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section:
  1. With minimum five (5) years documented experience.
  2. Approved by membrane manufacturer.

1.05 WARRANTY
- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within 10 years after installation.
- C. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
  1. Warranty Term: 20 years.
  2. For repair and replacement include costs of both material and labor in warranty.
  3. Include accidental punctures according to the manufacturer's standard warranty terms.
  4. Include hail damage according to the manufacturer's standard warranty terms.

PART 2 PRODUCTS

2.01 MANUFACTURER
- A. Carlisle SynTec Systems: www.carlisle-syntec.com.

2.02 ROOFING APPLICATIONS
- A. TPO Membrane Roofing: One ply membrane, asphalt adhered, over insulation.
- B. Roofing Assembly Performance Requirements and Design Criteria:

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS
- A. Membrane:
  1. Material: Thermoplastic Polyolefin (TPO) complying with ASTM D6878/D6878M.
  2. Thickness: 60 mil (0.060 inch), minimum.
  3. Sheet Width: Factory fabricated into largest sheets possible.
  4. Color: To be selected by Architect from manufacturer's full color range.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Flexible Flashing Material: Same material as membrane.
- D. Base Flashing: Provide waterproof, fully adhered base flashing system at all penetrations, plane transitions, and terminations.

2.04 INSULATION
- A. Polyisocyanurate (ISO) Board Insulation: Complies with ASTM C1289, Type II, Class 1 - Faced with glass-reinforced felt on both surfaces of core foam.
  1. Grade and Compressive Strength: Grade 2, 20 psi, minimum.
  2. Board Thickness: 1/2 inch.
  3. Product: Carlisle InsulBase.

2.05 ACCESSORIES
- A. Prefabricated Flashing Accessories:
  1. Corners and Seams: Same material as membrane, in manufacturer's standard thicknesses.
  2. Penetrations: Same material as membrane, with manufacturer's standard cut-outs, rigid inserts, clamping rings, and flanges.
  3. Sealant Pockets: Same material as membrane, with manufacturer's standard accessories, in manufacturer's standard configuration.
  4. Pressure Sensitive Cover Strips: 6 inches wide, 45 mil, 0.045 inch thick, non-reinforced TPO membrane laminated to 35 mil, 0.035 inch thick cured synthetic rubber with pressure sensitive adhesive.
  5. Miscellaneous Flashing: Non-reinforced TPO membrane; 80 mil, 0.080 inch thick, in manufacturer's standard lengths and widths.
- B. Membrane Adhesive: As recommended by membrane manufacturer.
- C. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- D. Sealants: As recommended by membrane manufacturer.

1. Product:

E. Cleaner: Manufacturer's standard, clear, solvent-based cleaner.

1. Product: Carlisle Weathered Membrane Cleaner.

F. Edgings and Terminations: Manufacturer's standard edge and termination accessories.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 PREPARATION, GENERAL

A. Clean substrate thoroughly prior to roof application.

B. Do not begin work until other work that requires foot or equipment traffic on roof is complete.

C. Apply manufacturer's recommended vapor retarder or temporary roof before roof installation.

3.03 WOOD DECK PREPARATION

A. Verify flatness and tightness of joints of wood decking. Verify that all wood decking edges are fully supported. Fill knot holes with latex filler or completely cover with securely nailed sheet metal.

3.04 INSTALLATION - GENERAL

A. Perform work in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

B. Do not apply roofing membrane during unsuitable weather.

C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

3.05 INSULATION APPLICATION

A. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.

B. Lay boards with edges in moderate contact without forcing, and gap between boards no greater than 1/4 inch. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

C. Do not apply more insulation than can be completely waterproofed in the same day.

3.06 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

B. Shingle joints on sloped substrate in direction of drainage.

C. Fully Adhered Application: Apply adhesive at manufacturer's recommended rate. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

D. Seam Welding:

1. Seam Welding: Overlap edges and ends and seal seams by heat welding, minimum 2 inches.
2. Cover seams with manufacturer's recommended joint covers.
3. Probe seams once welds have thoroughly cooled, in approximately 30 minutes.
4. Repair deficient seams within the same day.
5. Seal cut edges of reinforced membrane after seam probe is complete.

E. At intersections with vertical surfaces:

1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
2. Fully adhere flexible flashing over membrane and up to nailing strips.

F. Coordinate installation of roof drains and sumps and related flashings. Locate all field splices away from low areas and roof drains. Lap upslope sheet over downslope sheet.

G. Install walkway pads at areas of concentrated traffic and as shown on Drawings. Space pad joints to permit drainage.

H. Lay concrete pavers loose over manufacturer approved protection sheet and according to manufacturer's instructions.

I. Daily Seal: Install daily seal per manufacturers instructions at the end of each work day. Prevent infiltration of water at incomplete flashings, terminations, and at unfinished membrane edges.

3.07 CLEANING

A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.

B. Remove wrappings, empty containers, paper, and other debris from the roof daily. Dispose of debris in compliance with local, State, and Federal regulations.

C. Remove bituminous markings from finished surfaces.

D. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

E. Repair or replace defaced or damaged finishes caused by work of this section.

3.08 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 6200 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, exterior penetrations, and other items indicated in Schedule.

B. Sealants for joints within sheet metal fabrications.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

D. CDA A4050 - Copper in Architecture - Handbook; current edition.

E. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

C. Samples: Submit two samples 3" x 3" inch in size illustrating metal finish color.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sheet Metal Flashing and Trim:

1. ATAS International, Inc.: www.atas.com.
2. Fairview Architectural LLC; Edgeline Metal Flashing: www.fairview-na.com.
3. Metal-Era Inc.: www.metalera.com.
4. **Basis of Design:** Petersen Aluminum Corporation: www.pac-clad.com.
5. Substitutions: See Section 01 6000 - Product Requirements.

B. Exterior Penetration Flashing Panel:

1. Quickflash Weatherproofing Products, Inc: www.quickflashproducts.com.
2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SHEET MATERIALS

A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch thick base metal, shop pre-coated with PVDF coating.

1. Color: As selected by Architect from manufacturer's standard colors.

B. Pre-Finished Aluminum: ASTM B209 (ASTM B209M)[<>];20 gage [.032] inch thick; plain finish shop pre-coated with fluoropolymer coating

1. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
2. Color: As selected by Architect from manufacturer's standard colors.

2.03 ACCESSORIES

A. Fasteners: Same material and finish as flashing metal.

B. Sealant: Type as specified in Section 07 9200 - Joint Sealants.

2.04 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch; miter and seam corners.

D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18-inch long legs; seam for rigidity, seal with sealant.

F. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

2.05 Flashing

A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.

2.06 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.

B. Primer Type: Zinc chromate.

C. Concealed Sealants: Non-curing butyl sealant.

D. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

E. Fenestration Perimeter Flashing Attachments: Two-piece flashing receiver and clip of extruded aluminum, at least 0.045 inch thick, for attaching flashing at perimeter of exterior wall fenestration openings.

1. Provide flashing receiver profile appropriate for flashing applications.

F. Coping cap shall be .050" aluminum formed as indicated with allowance for expansion and contraction. Support and fasten to curb with manufacturer's standard chair and cleating system; all fasteners and splice plates concealed. All exposed metal shall be prefinished aluminum coated with full strength Kynar 500 finish with 20 year warranty.

G. Provide Hickman 'Permasnap Coping' or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch.

3.03 INSTALLATION

A. Comply with drawing details and SMACNA's Architectural Sheet Metal Manual.

B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

C. Apply plastic cement compound between metal flashings and felt flashings.

D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

E. Exterior Flashing Receivers: Install in accordance with manufacturer's recommendations, and in proper relationship with adjacent construction, and as follows:

F. Seal metal joints watertight.

END OF SECTION

SECTION 07 7100 - ROOF SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured roof specialties, including fascias and soffits.

1.02 REFERENCE STANDARDS

A. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2017.

B. NRCA (RM) - The NRCA Roofing Manual; 2017.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.

C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

D. Samples: Submit two appropriately sized samples of fascia and soffit.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Roof Edge Flashings and Copings:

1. Architectural Products Co: www.archprod.com.
2. ATAS International, Inc; Rapid-Lok Fascia: www.atas.com.
3. Drexel Metals Inc; Fascia: www.drexmet.com.
4. Hickman: www.hickmanedgesystems.com.
5. Metal-Era Inc: www.metalera.com.
6. Substitutions: See Section 01 6000 - Product Requirements.

B. Pipe and Penetration Flashings:

1. Elmdor Stonemen: www.elmdorstoneman.com.
2. Portals Plus: www.portalsplus.com.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS

A. Roof Edge Flashings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners.

1. Configuration: Fascia, soffit, and edge securement for roof membrane.
2. Material: Formed aluminum sheet, 0.050 inch thick, minimum.
3. Finish: Kynar finish.
4. Color: To be selected by Architect from manufacturer's standard range.

2.03 ACCESSORIES

A. Sealant: As specified in Section 07 9200 - Joint Sealants.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

B. Seal joints within components when required by component manufacturer.

C. Anchor components securely.

END OF SECTION

SECTION 07 7123 - MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pre-finished aluminum gutters and downspouts.

1.02 RELATED REQUIREMENTS

A. Section 07 6200 - Sheet Metal Flashing and Trim.

1.03 REFERENCE STANDARDS

A. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Comply with SMACNA (ASMM) for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on prefabricated components.

C. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.

D. Color Samples: Submit manufacturer's color samples of gutters, consisting of complete set of metal color chips representing manufacturer's full range of available colors.

E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

F. Warranty Documentation: Submit manufacturer's standard warranty.

1.06 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Manufacturer's regularly engaged in the manufacturing of gutters of similar type to that specified for a minimum of 5 years.

B. Installer's Qualifications:

1. Installer regularly engaged in installation of gutters of similar type to that specified for a minimum of 5 years.
2. Use persons trained for installation of gutters.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying.

B. Storage and Handling Requirements:

1. Store and handle materials in accordance with manufacturer's instructions.
2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
3. Store materials in clean, dry area indoors.
4. Do not store materials directly on floor or ground.
5. Protect materials and finish during storage, handling and installation to prevent damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Gutters and Downspouts:

1. ATAS International, Inc; Commerical Gutter: www.atas.com.
2. Drexel Metals Inc; K-Style: www.drexmet.com.
3. **Basis of Design:** Petersen Aluminimum Corp.; Pac-Tite LT Gutter: K-Style: www.pac-clad.com.
4. Meta-Era: www.metalera.com.
5. SAF Perimeter Systems, a division of Southern Aluminum Finishing Company, Inc: www.saf.com/persys.
6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Aluminum Sheet: ASTM B209 (ASTM B209M); 0.050 inch thick.

1. Finish: Kynar 500.
2. Color: As selected from manufacturer's standard colors.

2.03 COMPONENTS

A. Gutters: Profile as indicated.

B. Downspouts: SMACNA Rectangular profile.

C. Anchors and Supports: Profiled to suit gutters and downspouts.

1. Anchoring Devices: In accordance with CDA requirements.
2. Gutter Supports: Brackets.
3. Downspout Supports: Brackets.

D. Fasteners: Galvanized steel , with soft neoprene washers.

2.04 ACCESSORIES

A. Downspout Boots: Plastic.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that surfaces are ready to receive work.

3.02 PREPARATION

A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.

B. Slope gutters 1/4 inch per 10 feet. .
C. Connect downspouts to downspout boots. Seal connection watertight.

END OF SECTION

SECTION 07 8400 - FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 09 2116 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2020.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).

C. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2015 (Reapproved 2019).

D. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus; 2020.

E. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2013 (Reapproved 2017).

F. ITS (DIR) - Directory of Listed Products; current edition.

G. FM (AG) - FM Approval Guide; current edition.

H. SCAQMD 1168 - Adhesive and Sealant Applications; 1989 (Amended 2017).

I. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.

J. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

K. UL (DIR) - Online Certifications Directory; Current Edition.

L. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

D. Sustainable Design Submittal: Submit VOC content documentation for nonpreformed materials.

E. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Certificate from authority having jurisdiction indicating approval of materials used.

H. Manufacturer's qualification statement.

I. Installer's qualification statement.

1.05 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated, ASTM E119, and ASTM E814.

1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and:

1. Verification of minimum three years documented experience installing work of this type.
2. Licensed by local authorities having jurisdiction (AHJ).

D. Coordination: Cross-coordinate rated and structural assemblies with penetrating products shown on plans and shop drawings of work by other divisions.

1.06 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Firestopping Manufacturers:

1. 3M Fire Protection Products: www.3m.com/firestop.
2. A/D Fire Protection Systems Inc: www.adfire.com.
3. Hilti, Inc: www.us.hilti.com.
4. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com.
5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Manufacturers:

1. A/D Fire Protection Systems Inc.: www.adfire.com.
2. 3M Fire Protection Products: www.3m.com/firestop.
3. Nelson FireStop Products: www.nelsonfirestop.com.
4. Specified Technologies, Inc.: www.stifirestop.com.

B. Firestopping Materials: Any materials meeting requirements.

C. Volatile Organic Compound (VOC) Content: Provide products having VOC content lower than that required by SCAQMD 1168.
D. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials for tested firestopping assembly.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
   1. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.
B. Membrane Penetration Firestopping: For all membrane penetrations, provide firestopping systems that have been tested according to ASTM E814 to have a pressure differential of .01" of water, and with fire resistance, F and T Rating not less than the required fire rating of penetrated assembly.
C. Non-standard firestopping applications: for plumbing cleanouts, electrical panels, and other non-standard penetrations in rated and/or structural bearing wall membranes, provide listed systems with supporting fire engineering determination for modifications and submit for approval to local building and fire authorities.

2.04 FIRESTOPPING SYSTEMS

A. Firestopping: Any material meeting requirements.
   1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.
B. Remove incompatible materials that could adversely affect bond.
C. Install backing materials to prevent liquid material from leakage.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
B. Do not cover installed firestopping until inspected by Owner's Independent Testing Agency.
C. Do not cover installed firestopping until inspected by authorities having jurisdiction.
D. Install labeling required by code.

3.04 FIELD QUALITY CONTROL

A. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.05 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.06 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07 9200 - JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.
B. Self-leveling pourable joint sealants.
C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.
B. Section 07 9100 - Preformed Joint Seals: Precompressed foam, gaskets, and strip seals.
C. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
D. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.03 REFERENCE STANDARDS

A. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2018.
B. ASTM C834 - Standard Specification for Latex Sealants; 2017.
C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.
E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2018.
G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2018.
H. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2019 (Reapproved 2020).
I. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2020.
J. UL 263 - Standard for Fire Tests of Building Construction and Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Backing material recommended by sealant manufacturer.
   4. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   5. Substrates the product should not be used on.
   6. Substrates for which use of primer is required.
   7. Certification by manufacturer indicating that product complies with specification requirements.
C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
D. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.
E. Sustainable Design Documentation: For sealants and primers, submit VOC content and emissions documentation; see Section 01 6116.
F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.
G. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.
H. Field Quality Control Plan: Submit at least two weeks prior to start of installation.
I. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.
J. Field Quality Control Log: Submit filled-out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.
K. Executed warranty.

1.05 QUALITY ASSURANCE

A. General: Provide joint sealants where called for on the drawings and where indicated in this section.
   1. At building exterior provide joint sealants where necessary to prevent water and air intrusion or to protect substrates from water infiltration or damage.
   2. At building interior provide sealants where shown on the drawings and as articulated in this section and where necessary to provide a workmanlike finish product.
B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
D. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
   1. Adhesion Testing: In accordance with ASTM C794.
   2. Compatibility Testing: In accordance with ASTM C1087.
   3. Stain Testing: In accordance with ASTM C1248; required only for stone substrates.
   4. Allow sufficient time for testing to avoid delaying the work.

5. Deliver sufficient samples to manufacturer for testing.
6. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
7. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

E. Preinstallation Field Adhesion Test Plan: Include destructive field adhesion testing of one sample of each combination of sealant type and substrate, except interior acrylic latex sealants, and include the following for each tested sample.
1. Identification of testing agency.
2. Preinstallation Field Adhesion Test Log Form: Include the following data fields, with known information filled out.
a. Test date.
b. Copy of test method documents.
c. Age of sealant upon date of testing.
d. Test results, modeled after the sample form in the test method document.
e. Indicate use of photographic record of test.

F. Field Quality Control Plan:
1. Visual inspection of entire length of sealant joints.

G. Field Adhesion Test Procedures:
1. Allow sealants to fully cure as recommended by manufacturer before testing.
2. Have a copy of the test method document available during tests.
3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
4. When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
5. Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to Owner.
6. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.

H. Nondestructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.

I. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.
1. Sample: At least 18 inches long.
2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the 1-inch mark is that distance from the substrate, the test has failed.
3. If either adhesive or cohesive failure occurs before minimum elongation, take necessary measures to correct conditions and retest; record each modification to products or installation procedures.

J. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or another applicable method as recommended by manufacturer.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

C. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Nonsag Sealants:
1. Adhesives Technology Corporation: www.atcepoxy.com.
2. Bostik Inc: www.bostik-us.com.
3. Dow Chemical Company: consumer.dow.com/en-us/industry/ind-building-construction.html.
4. **Basis of Design:** Franklin International, Inc: www.titebond.com.
5. Henry Company: www.henry.com.
6. Hilti, Inc: www.us.hilti.com.
7. Master Builders Solutions: www.master-builders-solutions.com/en-us.
8. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.
9. Pecora Corporation: www.pecora.com.
10. QUIKRETE Companies: www.quikrete.com.
11. Sika Corporation: www.usa-sika.com.
12. Specified Technologies Inc: www.stifirestop.com.
13. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com.
14. W.R. Meadows, Inc: www.wrmeadows.com.
15. Substitutions: See Section 01 6000 - Product Requirements.

B. Self-Leveling Sealants:

1. Bostik Inc: www.bostik-us.com.
2. Dow: www.dow.com.
3. Master Builders Solutions: www.master-builders-solutions.com/en-us.
4. Pecora Corporation: www.pecora.com.
5. QUIKRETE Companies: www.quikrete.com.
6. Sika Corporation: www.usa.sika.com.
7. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com.
8. W.R. Meadows, Inc: www.wrmeadows.com.
9. Substitutions: See Section 01 6000 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:
1. Exterior Joints:
a. Do not seal exterior joints unless indicated on drawings as sealed.
2. Interior Joints:
a. Do not seal interior joints indicated on drawings as not sealed.

B. Interior Wet Areas: Bathrooms, restrooms, kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, other similar items.

C. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

2.03 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products with acceptable levels of volatile organic compound (VOC) content; see Section 01 6116.

2.04 NONSAG JOINT SEALANTS

A. All Exterior Building Joints. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: 30%, minimum.
2. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
3. Color: To be selected by Architect from manufacturer's standard range.
4. Products:
a. Dow; DOWSIL 756 SMS Building Sealant: www.dow.com.
b. Dow; DOWSIL 790 Silicone Building Sealant: www.dow.com.
c. **Basis of Design:** Franklin International, Inc.; Titebond; Ultimate MP Sealant: www.titebond.com.
d. Momentive Performance Materials, Inc/GE Silicones; SCS9000 SilPruf NB - Non-Staining Silicone Weatherproofing Sealant: www.siliconeforbuilding.com.
e. Pecora Corporation; Pecora 890 NST (Non-Staining Technology): www.pecora.com.
f. Pecora Corporation; Pecora 864 NST (Non-Staining Technology): www.pecora.com.
g. Sika Corporation; Sikasil WS-290: www.usa.sika.com.
h. Sika Corporation; Sikasil WS-295: www.usa.sika.com.
i. Tremco Commercial Sealants & Waterproofing; Spectrem 1: www.tremcosealants.com.
j. Tremco Commercial Sealants & Waterproofing; Spectrem 2: www.tremcosealants.com.
k. Tremco Commercial Sealants & Waterproofing; Spectrem 3: www.tremcosealants.com.
l. Tremco Commercial Sealants & Waterproofing; Tremsil 200: www.tremcosealants.com.
m. Tremco Commercial Sealants & Waterproofing; Tremsil 400: www.tremcosealants.com.
n. Substitutions: See Section 01 6000 - Product Requirements.

B. Silicone Sealant: ASTM C920, Grade NS, Uses M, A, G, and O; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 25 percent, minimum.
2. Color: To be selected by Architect from manufacturer's standard range.
3. Products:
a. Dow; DOWSIL 999-A Building and Glazing Sealant: www.dow.com.
b. **Basis of Design:** Franklin International, Inc; Titebond 100% Silicone Sealant: www.titebond.com.
c. Momentive Performance Materials, Inc/GE Silicones; SCS2000 SilPruf - Silicone Sealant and Adhesive: www.siliconeforbuilding.com.
d. Momentive Performance Materials, Inc/GE Silicones; SSG4600 UltraGlaze - Silicone Structural Glazing Adhesive: www.siliconeforbuilding.com.
e. Pecora Corporation; Pecora 860: www.pecora.com.
f. Pecora Corporation; Pecora 890FTS (Field Tintable Smooth): www.pecora.com.
g. Sika Corporation; Sikasil GP: www.usa.sika.com.
h. Sika Corporation; Sikasil WS-295: www.usa.sika.com.
i. Sika Corporation; Sikasil N-Plus US: www.usa.sika.com.
j. Substitutions: See Section 01 6000 - Product Requirements.

C. Use at interior kitchens and bathroom counters and plumbing fixtures. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
1. Color: To be selected by Architect from manufacturer's standard range.
2. Products:
a. Pecora Corporation: 898 NST; www.pecora.com.
b. **Basis of Design:** Franklin International, Inc.; Titebond Kitchen and Bath Sealant: www.titebond.com.
c. Sika Corporation; Sikasil GP: www.usa.sika.com.

d. Substitutions: See Section 01 6000 - Product Requirements.

D. Polymer Sealant: ASTM C920; single component, cured sealant is paintable and mold/mildew resistant, low odor and VOC, and ultraviolet (UV) resistant.
1. Color: To be selected by Architect from manufacturer's standard range.
2. Products:
a. DAP Products Inc; DYNAFLEX 800 Sealant: www.dapspecline.com.
b. **Basis of Design:** Franklin International, Inc.; Titebond WeatherMaster Sealant: www.titebond.com.
c. SIGA Cover Inc; SIGA-Meltell: www.siga.swiss/global_en.
d. Substitutions: See Section 01 6000 - Product Requirements.

E. Hybrid Urethane Sealant: Use at exterior general purpose joints. ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 50 percent, minimum.
2. Color: To be selected by Architect from manufacturer's standard range.
3. Products:
a. **Basis of Design:** Franklin International Inc; Titebond WeatherMaster ULTIMATE MP Sealant: www.titebond.com.
b. Master Builders Solutions; MasterSeal NP100: www.master-builders-solutions.com/en-us.
c. Tremco Commercial Sealants and Waterproofing; Dymonic FC: www.tremcosealants.com.
d. Substitutions: See Section 01 6000 - Product Requirements.

F. Type I-2 - Polyurethane Sealant: ASTM C920, Grade NS, UsesNT, T, M, A, and I; single or multi-component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 50 percent, minimum.
2. Color: To be selected by Architect from manufacturer's standard range.
3. Products:
a. Master Builders Solutions; MasterSeal NP1: www.master-builders-solutions.com/en-us.
b. Pecora Corporation; DynaTrol II: www.pecora.com.
c. Pecora Corporation; DynaFlex: www.pecora.com.
d. Sika Corporation; Sikaflex-1a: www.usa.sika.com.
e. Sika Corporation; Sikaflex-15 LM: www.usa.sika.com.
f. Sika Corporation; Sikaflex-2c NS: www.usa.sika.com.
g. Tremco Commercial Sealants & Waterproofing; Dymonic 100: www.tremcosealants.com.
h. Tremco Commercial Sealants & Waterproofing; Vulkem 116: www.tremcosealants.com.
i. W. R. Meadows, Inc; POURTHANE NS: www.wrmeadows.com.
j. Substitutions: See Section 01 6000 - Product Requirements.

G. Use at pavement joints; Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface .
1. Movement Capability: Plus and minus 35 percent, minimum.
2. Color: Match adjacent finished surfaces.
3. Products:
a. Sika Corporation; Sikaflex-1a: www.usa.sika.com.
b. Substitutions: See Section 01 6000 - Product Requirements.

H. Type ___ - Acrylic-Urethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; paintable; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 12-1/2 percent, minimum.
2. Color: To be selected by Architect from manufacturer's standard range.
3. Products:
a. DAP Products Inc; DYNAFLEX 920 Sealant: www.dapspecline.com.
b. **Basis of Design:** Franklin International, Inc; Titebond UA 920 Sealant: www.titebond.com.
c. Substitutions: See Section 01 6000 - Product Requirements.

I. Use at interior general purpose joints. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
1. Color: To be selected by Architect from manufacturer's standard range.
2. Grade: ASTM C834; Grade 0 Degrees F (Minus 18 Degrees C).
3. Products:
a. DAP Alex Flex premium molding and trim sealant, ASTM C920, Class 12.5: www.dap.com
b. **Basis of Design:** Franklin International, Inc; Titebond GREENchoice Acoustical Smoke & Sound Sealant: www.titebond.com.
c. Hilti, Inc; CP 506 Smoke and Acoustical Sealant: www.us.hilti.com.
d. Pecora Corporation; AC-20 +Silicone: www.pecora.com.
e. Specified Technologies Inc; Smoke N' Sound Acoustical Sealant: www.stifirestop.com.
f. Tremco Commercial Sealants & Waterproofing; Tremflex 834: www.tremcosealants.com.
g. Substitutions: See Section 01 6000 - Product Requirements.

J. Acrylic Latex Sealant, Water-Based: ASTM C834 Type OP - Opaque and Grade Minus 18 degrees C (0 degrees F); ASTM C920 Class 100/50 for white and colors, and Class 25/25 for clear.
1. Color: To be selected by Architect from manufacturer's standard range.
2. Products:
a. **Basis of Design:** Franklin International, Inc; Titebond Duramaster Sealant: www.titebond.com.

b. Substitutions: See Section 01 6000 - Product Requirements.

K. Acrylic Latex Sealant: ASTM C834; for use as acoustical sealant and in firestopping systems for expansion joints and through penetrations.
1. Color: To be selected by Architect from manufacturer's standard range.
2. Fire Rated System: Complies with UL 263 and ASTM E119 with UL fire resistance classifications.
3. Products:
a. Pecora Corporation; AC-20 FTR (Fire and Temperature Rated): www.pecora.com.
b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 ACCESSORIES

A. Sealant Backing Materials, General: Materials placed in joint before applying sealants; assists sealant performance and service life by developing optimum sealant profile and preventing three-sided adhesion; type and size recommended by sealant manufacturer for compatibility with sealant, substrate, and application.

B. Sealant Backing Rod, Closed-Cell Type:
1. Cylindrical flexible sealant backings complying with ASTM C1330 Type C.
2. Size: 25 to 50 percent larger in diameter than joint width.
3. Products:
a. Nomaco, Inc; HBR: www.nomaco.com.
b. Hohmann & Barnard: www.h-b.com.
c. Substitutions: See Section 01 6000 - Product Requirements.

C. Sealant Backing Rod, Open-Cell Type:
1. Cylindrical flexible sealant backings complying with ASTM C1330 Type O.
2. Size: 25 to 50 percent larger in diameter than joint width.
3. Products:
a. Nomaco, Inc; OCFoam: www.nomaco.com.
b. Hohmann & Barnard: www.h-b.com.
c. Substitutions: See Section 01 6000 - Product Requirements.

D. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

E. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

F. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.

G. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.
1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.
2. Notify Architect of date and time that tests will be performed, at least seven days in advance.
3. Record each test on Preinstallation Adhesion Test Log as indicated.
4. If any sample fails, review products and installation procedures, consult manufacturer, or take other measures that are necessary to ensure adhesion; retest in a different location; if unable to obtain satisfactory adhesion, report to Architect.
5. After completion of tests, remove remaining sample material and prepare joints for new sealant installation.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Provide joint sealant installations complying with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

H. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width, i.e., at low temperature in thermal cycle. Report failures immediately and repair them.

END OF SECTION

SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.
B. Fire-rated hollow metal doors and frames.
C. Thermally insulated hollow metal doors with frames.
D. Commercial security hollow metal doors and frames.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware.
B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.
B. ASCE: American Society of Civil Engineers.
C. HMMA: Hollow Metal Manufacturers Association.
D. NAAMM: National Association of Architectural Metal Manufacturers.
E. NFPA: National Fire Protection Association.
F. SDI: Steel Door Institute.
G. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
B. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.
C. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames; 2007 (R2011).
D. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.
E. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
F. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
H. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023.
I. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.
J. BHMA A156.115 - Hardware Preparation In Steel Doors And Steel Frames; 2016.
K. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
L. ITS (DIR) - Directory of Listed Products; current edition.
M. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
N. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
O. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.
P. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2006.
Q. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
R. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2022.
S. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
T. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.
U. UL (DIR) - Online Certifications Directory; Current Edition.
V. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
W. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
   1. Provide hollow metal frames from SDI Certified manufacturer.
B. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Therma Tru
   2. Rediframe Dunbarton Corp.
   3. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com.
   4. De La Fontaine Inc: www.delafontaine.com.
   5. Pioneer Door, an Assa Abloy Group company; Heavy Duty Doors: www.pioneerindustries.com.
   6. **Basis of Design:** Premier Steel Doors and Frames: www.trustpremier.com.
   7. Republic Doors: www.republicdoor.com.
   8. Steelcraft, an Allegion brand: www.allegion.com/us.
   9. Technical Glass Products; SteelBuilt Window & Door Systems: www.tgpamerica.com.
   10. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Steel.
   5. Typical Door Face Sheets: 2 panel.
   6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
   7. All double egress doors and frames to be 14 ga.
   8. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
   9. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
      a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level heavy duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 2-Panel.
      d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum for metal exit door/stairwell doors. All other hallow metal door frames to be 16 gauge knock down frames (timely or Redi frames) to be 18 gauge minimum.
   2. Door Thermal Resistance: R-Value of 6.0 minimum, for installed thickness of polystyrene.
   3. Door Thickness: 1-3/4 inches, nominal.
   4. All double egress doors and frames to be 14 ga.

C. Interior Doors, Non-Fire Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 2 - Heavy-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 2-Panel.
      d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
   2. Door Core Material: Polystyrene.
   3. Door Thickness: 1-3/4 inches, nominal.

D. Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 2 - Heavy-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 2-Panel.
      d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
   2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
      a. Provide units listed and labeled by UL (DIR) or ITS (DIR).
      b. Attach fire rating label to each fire rated unit.

c. Smoke and Draft Control Doors (Indicated with letter "S" on Drawings and/or Door Schedule): Self-closing or automatic closing doors in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following;
1) Maximum Air Leakage: 3.0 cfm/sq ft of door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
2) Gasketing: Provide gasketing or edge sealing as necessary to achieve leakage limit.
3) Label: Include the "S" label on fire-rating label of door.

3. Door Core Material: Polystyrene.
4. Door Thickness: 1-3/4 inches, nominal.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
B. Exterior Door Frames: Knock-down type.
1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
2. Frame Metal Thickness: 18 gauge, 0.042 inch, minimum.
3. Frame Finish: Factory primed and field finished.
4. Weatherstripping: Separate, see Section 08 7100.
C. Interior Door Frames, Non-Fire Rated: Knock-down type.
1. Frame Metal Thickness: 18 gauge, 0.042 inch, minimum.
2. Frame Finish: Factory primed and field finished.
D. Door Frames, Fire-Rated: Knock-down type.
1. Fire Rating: Same as door, labeled.
2. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch, maximum, above floor at 45 degree angle.
3. Frame Metal Thickness: 18 gauge, 0.042 inch, minimum.
4. Frame Finish: Factory primed and field finished.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
B. Factory Finish: Complying with ANSI/SDI A250.3, manufacturer's standard coating.
1. Color: As selected by Architect from manufacturer's standard range.

2.06 ACCESSORIES

A. Louvers: Roll formed steel with overlapping frame; finish same as door components ; factory-installed.
1. In Fire-Rated Doors: UL (DIR) or ITS (DIR) listed fusible link louver, same rating as door.
B. Door Window Frames: Door window frames with glazing securely fastened within door opening.
C. Glazing: As specified in Section 08 8000, factory installed.
D. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
E. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
F. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.
C. Verify that finished walls are in plane to ensure proper door alignment.
D. Verify necessary flashings are in place at exterior doors before installation.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
B. Install fire rated units in accordance with NFPA 80.
C. Coordinate frame anchor placement with wall construction.
D. Install door hardware as specified in Section 08 7100.
E. At exterior doors install necessary flashing at head of door appropriate to the detail and adjacent materials.
F. Coordinate installation of electrical connections to electrical hardware items.
G. Touch up damaged factory finishes.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 08 1433 - STILE AND RAIL HARDBOARD DOORS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Interior stile and rail hardboard doors.
   2. Shop priming, Factory finishing stile and rail hardboard doors.
   3. Factory fitting stile and rail hardboard doors to frames and factory machining for hardware.

B. Related Sections include the following:
   1. Division 6 Section "Finish Carpentry, Interior Architectural Woodwork" for wood door frames.
   2. Division 6 Section "Interior Architectural Woodwork" for requirements for veneers from the same flitches for both architectural woodwork and stile and rail hardboard doors.

1.03 SUBMITTALS

A. Product Data: For each type of door. Include details of construction.
   1. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings (sticking); and other pertinent data.
   1. Indicate dimensions and locations of mortises and holes for hardware.
   2. Indicate requirements for veneer matching.
   3. Indicate doors to be factory finished and finish requirements.
   4. Indicate fire ratings for fire doors.

C. Samples for Initial Selection: For factory-finished doors.

D. Samples for Verification: Corner sections of doors, approximately 8 by 10 inches (200 by 250 mm), with door faces and edgings representing typical range of color and grain for each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.

E. Product Certificates: Signed by door manufacturers.

F. Warranty: Special warranty specified in this Section.

1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain stile and rail doors through one source from a single manufacturer.

B. Quality Standard for Doors of Stock Design and Construction: Comply with WDMA I.S.6, "Industry Standard for Wood Stile and Rail Doors," unless more stringent requirements are specified.
   1. Mark, label, or otherwise identify stile and rail hardboard doors as complying with WDMA I.S.6, and include panel design number if applicable.

C. Fire-Rated Wood Doors and Frames: Doors and frames complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252.
   1. Test Pressure: After 5 minutes into the test, the neutral pressure level in furnace shall be established at 40 inches (1000 mm) or less above the sill.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in opaque plastic bags or cardboard cartons.

C. Mark each door on top and bottom edge with opening number used on Shop Drawings.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.07 WARRANTY

A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, and have warped (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
   1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
   2. Warranty shall be in effect during the following period of time from date of Substantial Completion:
      a. Interior Doors: Five years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
   1. Basis-of-Design Product: The design for each stile and rail door is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the following manufacturers:
      a. Eggers Industries: www.eggersindustries.com.
      b. Karona, Inc.: www.karonadoor.com.
      c. Maiman Company: www.mainman.com.
      d. Marshfield DoorSystems, Inc.: www.marshfielddoors.com.
      e. **Basis of Design:** Masonite Corporation; Logan 2 Panel: www.masonite.com.
      f. Jeld-Wen: www.jeldwen.com.

2.02 MATERIALS

A. General: Use only materials that comply with referenced quality standards unless more stringent requirements are specified.
   1. Assemble interior doors, frames, and sidelites, including components, with either dry-use or wet-use adhesives complying with ASTM D 5572 for finger joints and ASTM D 5751 for joints other than finger joints.

B. Low-Emitting Materials:
   1. Provide doors made with adhesives and composite wood products that do not contain urea-formaldehyde resins.

C. Panel Products: Any of the following:
   1. Particleboard made from wood particles, with binder containing no urea-formaldehyde resin, complying with ANSI A208.1, Grade M-2.
   2. Particleboard made from straw, complying with ANSI A208.1, Grade M-2.
   3. Medium-density fiberboard made from wood fiber, with binder containing no urea-formaldehyde resin, complying with ANSI A208.2, Grade MD.
   4. Medium-density fiberboard made from agricultural waste fiber, complying with ANSI A208.2, Grade MD.
   5. Hardboard, complying with AHA A135.4.
   6. Veneer core plywood, made with adhesive containing no urea-formaldehyde resin.

D. Texture: Smooth.

E. Color: White.

F. Core: Solid core.

2.03 STILE AND RAIL DOORS OF STOCK DESIGN AND CONSTRUCTION

A. Manufacturer – **Basis of Design**:
   1. Molded Panel Series doors as manufactured by Masonite International Corporation with panel configuration as shown on the drawings.

B. Interior Doors:
   1. Door facings are to be bonded to stiles, rails and core forming a 3 ply structural attachment.
   2. Wood Materials for Opaque Finish: Manufacturer's standard materials and cut for stiles and rails; with panels of same species or wood-base construction materials, as standard with manufacturer.
   3. Interior Door Types:
      a. Raised panel doors both rated and unrated as depicted on the drawings.

C. Fire Protection Rated Doors: Provide core specified or mineral core as needed to provide fire protection rating indicated.

D. Door Frames:
   1. Wood jambs shall be fabricated as flat jamb with doorstop applied or 2-piece split jamb. Hinge jamb preparations for 1 3/8” thick doors to be machined for standard weight radius ;mortise 3 ½” hinges and 1 ¾” doors machined to accept 4” hinges. Strike jamb preparations shall be machined for scheduled hardware.

2.04 INTERIOR FIRE-RATED DOOR FRAMES

A. Manufacturers:
   1. Masonite International Corporation.

B. Frames, complete with casings, fabricated from solid fire-retardant-treated wood or from veneered fire-retardant particleboard, fire-retardant medium-density fiberboard, or mineral board.

2.05 FABRICATION

A. Fabricate stile and rail hardboard doors in sizes indicated for Project-site fitting.

B. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:
   1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/2 inch (13 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 3/8 inch (10 mm) from bottom of door to top of threshold.
      a. Comply with NFPA 80 for fire-rated doors.
   2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
   3. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) on lock edge; trim stiles and rails only to extent permitted by labeling agency.

C. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W Series standards, and hardware templates.
   1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

D. Glazed Openings: Glaze doors at factory with glass of type and thickness indicated, complying with Division 8 Section "Glazing." Install glass using manufacturer's standard elastomeric glazing sealant complying with ASTM C 920. Secure glass in place with removable wood stops.

E. Glazed Openings: Trim openings indicated for glazing with solid wood moldings, with one side removable.

F. Transom and Side Panels: Fabricate panels to match adjoining doors in materials, finish, and quality of construction.

G. Exterior Doors: Factory treat exterior doors after fabrication with water-repellent preservative to comply with WDMA I.S.4. Flash top of outswinging doors with manufacturer's standard metal flashing.

2.06 SHOP PRIMING

A. Doors for Opaque Finish: Shop apply one coat of wood primer specified in Division 9 Section "Painting" to faces and edges of doors, including mortises and cutouts.

2.07 Finishes:

A. Doors may be factory finished at contractor's option subject to owner's approval and selection of colors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine doors and substrates, with Installer present, for suitable conditions where wood stile and rail doors and fire-rated wood door frames will be installed.
   1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
   2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install fire-rated wood door frames level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
   1. Countersink fasteners, fill surface flush, and sand smooth.

B. Hardware: For installation, see Division 8 Section "Door Hardware."

C. Install wood doors to comply with manufacturer's written instructions and with referenced quality standard, and as indicated.
   1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.

D. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
   1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold.
      a. Comply with NFPA 80 for fire-rated doors.
   2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

E. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

F. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

G. Field-Finished Doors: Refer to the following for finishing requirements:
   1. Division 9 Section "Painting."

3.03 ADJUSTING AND PROTECTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081433

SECTION 08 1613 - FIBERGLASS DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Fiberglass doors.
- B. Fiberglass door frames.

1.02 RELATED REQUIREMENTS
- A. Section 08 7100 - Door Hardware.
- B. Section 08 8000 - Glazing.
- C. Section 09 9000 - Painting and Coating.

1.03 REFERENCE STANDARDS
- A. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2018.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
- C. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
- D. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- E. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- F. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
- G. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2014, Revision 14A.
- H. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2007.
- I. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS
- A. Coordination: Obtain hardware templates from hardware manufacturer prior to starting fabrication.

1.05 SUBMITTALS
- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard details, installation instructions, hardware and anchor recommendations.
- C. Shop Drawings: Indicate layout and profiles; include assembly methods.
  1. Indicate product components, including hardware reinforcement locations and preparations, accessories, finish colors, patterns, and textures.
- D. Samples: Submit full-size or partial full-size sample of door illustrating glazing system, quality of construction, texture and color finish.
- E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer; include detailed terms of warranty.

1.06 QUALITY ASSURANCE
- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING
- A. Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.
- B. Store materials in original packaging, under cover, protected from exposure to harmful weather conditions and from direct contact with water.
  1. Store at temperature and humidity conditions recommended by manufacturer.
  2. Do not use non-vented plastic or canvas shelters.
  3. Immediately remove wet wrappers.
- C. Store in position recommended by manufacturer, elevated minimum 4 inch above grade, with minimum 1/4 inch space between doors.

1.08 FIELD CONDITIONS
- A. Maintain temperature and humidity at manufacturer's recommended levels during and after installation of doors.

1.09 WARRANTY
- A. Provide ten (10) year manufacturer warranty covering materials and workmanship , including degradation or failure due to chemical contact.

PART 2 PRODUCTS

2.01 MANUFACTURERS
- A. Molded Fiberglass Doors: **Basis-of-Design Product**: Subject to compliance with requirements, provide Smooth Star Fiberglass doors by Therma-Tru or comparable product by one of the following:
  1. ChemPruf Door Company, Ltd: www.chem-pruf.com.
  2. Tiger Door, LLC: www.tigerdoor.com.
  3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOOR AND FRAME ASSEMBLIES
- A. Door and Frame Assemblies: Factory-fabricated, prepared and machined for hardware.
  1. Surface Burning Characteristics: Flame spread index (FSI) of 0 to 25, Class A, and smoke developed index (SDI) of 450 or less, when tested in accordance with ASTM E84.

2. Flammability: Self-extinguishing when tested in accordance with ASTM D635.
3. Clearance Between Door and Frame: 1/8 inch, maximum.
4. Clearance Between Bottom of Door and Finished Floor: 3/4 inch, maximum; not less than 1/4 inch clearance to threshold.

2.03 COMPONENTS

A. Doors: Fiberglass construction with reinforced core.
1. Thickness: 1-3/4 inch, nominal.
2. Core Material: Manufacturer's standard core material for application indicated.
3. Construction:
4. Face Sheet Texture: Smooth.
5. Subframe and Reinforcements: Manufacturer's standard materials.
6. Waterproof Integrity: Provide factory fabricated edges, cut-outs, and hardware preparations of fiberglass reinforced plastic (FRP); provide cut-outs with joints sealed independently of glazing, louver inserts, or trim.
7. Hardware Preparations: Factory reinforce, machine, and prepare for door hardware including field installed items; provide solid blocking for each item; field cutting, drilling or tapping is not permitted; obtain manufacturer's hardware templates for preparation as necessary.

B. Door Frames: Provide type in compliance with performance requirements specified for doors.
1. Type: Factory assembled with chemically welded joints.
2. Milled from 5/4 kiln-dried pine, profiled with 1/2-inch stop, depth to match wall construction. Provide brickmould where shown.
3. Rot Resistant.

C. Hinge and Hardware Fasteners: Manufacuter's standard corrosion resistant steel hinges; wood screws.

2.04 PERFORMANCE REQUIREMENTS

A. Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of 7.5 psf.

B. Air Leakage: Maximum of 0.1 cu ft/min/sq ft at 6.27 psf differential pressure, when tested in accordance with ASTM E283.

2.05 ACCESSORIES

A. Stops for Glazing: Fiberglass, unless otherwise indicated or required by fire rating; provided by door manufacturer to fit factory made openings, with color and texture to match door; fasteners shall maintain waterproof integrity.
1. Exterior Doors: Provide non-removable stops on exterior side with continuous compression gasket weatherseal.
2. Glazed Openings: Provide removable stops on interior side.
3. Opening Sizes and Shapes: As indicated on drawings.

B. Manufacturer's standard aluminum threshold full width of door. Provide ADA compliant accessible threshold at designated living units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify actual dimensions of openings by field measurements before door fabrication; show recorded measurements on shop drawings.

B. Do not begin installation until substrates have been properly prepared.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Remove existing doors and frames, and dispose of all removed materials in accordance with local authorities having jurisdiction.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Clean and prepare substrate in accordance with manufacturer's directions.

D. Protect adjacent work and finish surfaces from damage during installation.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions; do not penetrate frames with anchors.

B. Install exterior doors in accordance with ASTM E2112.

C. Install door hardware as specified in Section 08 7100.

D. Set thresholds in continuous bed of sealant.

E. Repair or replace damaged installed products.

3.04 ADJUSTING

A. Lubricate, test, and adjust doors to operate easily, free from warp, twist or distortion, and to fit watertight for entire perimeter.

B. Adjust hardware for smooth and quiet operation.

C. Adjust doors to fit snugly and close without sticking or binding.

3.05 CLEANING

A. Clean installed products in accordance with manufacturer’s instructions prior to owner’s acceptance.

3.06 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

SECTION 08 3100 - ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall-mounted access units.

B. Ceiling-mounted access units.

1.02 RELATED REQUIREMENTS

A. Section 23 3300 - Air Duct Accessories: Access doors in ductwork.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Shop Drawings: Indicate exact position of each access door and/or panel unit.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

A. Wall-Mounted Units:

1. Location: As indicated on drawings.
2. Panel Material: Steel.
3. Size: 12 by 12 inches.
4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

B. Wall-Mounted Units in Wet Areas:

1. Location: As indicated on drawings.
2. Panel Material: Steel, hot-dipped zinc, or zinc-aluminum-alloy coated.
3. Size: 12 by 12 inches.
4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

C. Fire-Rated Wall-Mounted Units:

1. Location: As indicated on drawings.
2. Wall Fire-Rating: As indicated on drawings.
3. Panel Material: Steel.
4. Size: 12 by 12 inches.
5. Door/Panel: Insulated double-surface panel, with tool-operated spring or cam lock and no handle.

D. Ceiling-Mounted Units:

1. Location: As indicated on drawings.
2. Panel Material: Steel.
3. Size - Lay-In Grid Ceilings: To match module of ceiling grid.
4. Size - Other Ceilings: 12 by 12 inches.
5. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

E. Fire-Rated Ceiling-Mounted Units:

1. Location: As indicated on drawings.
2. Ceiling Fire-Rating: As indicated on drawings.
3. Panel Material: Steel.
4. Size: 12 by 12 inches.
5. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

2.02 Wall- and Ceiling-MOUNTED ACCESS UNITS

A. Manufacturers:

1. ACUDOR Products Inc: www.acudor.com.
2. **Basis of Design:** Babcock-Davis: www.babcockdavis.com.
3. Cendrex, Inc: www.cendrex.com.
4. Elmdor: www.elmdor.com.
5. Cesco Products; www.cescoproducts.com.
6. Karp Associates, Inc: www.karpinc.com .
7. MIFAB, Inc: www.mifab.com.
8. Milcor by Commercial Products Group of Hart & Cooley, Inc: www.milcorinc.com .
9. Nystrom, Inc: www.nystrom.com.
10. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to proceeding with this work.

B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION

SECTION 08 4313 - ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

1.02 RELATED REQUIREMENTS

A. Section 05 5000 - Metal Fabrications: Steel attachment devices.
B. Section 07 9005 - Joint Sealers: Perimeter sealant and back-up materials.
C. Section 08 7100 - Door Hardware: Hardware items other than specified in this section.
D. Section 08 8000 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.
B. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.
C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
E. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021.
F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
H. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
I. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
J. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
K. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details and manufacturer's literature for each specified system.
C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
E. Finish Samples: Submit two samples 2x3 inches in size for each finish type illustrating finished aluminum surface.
F. System Components Samples: Submit corner sample, anchors, fasteners, trim and other materials as requested by the Architect.
G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered manufacturer.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.
B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.
B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of this Work to be performed according to manufacturer's installation instructions and warranty requirements.
B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before fabrication of storefront framing and indicate measurements on Shop Drawings.
C. Install sealant according to sealant manufacturer guidelines.
D. Coordinate installation with other applicable trades

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
B. Correct defective Work within a five year period after Date of Substantial Completion.
C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

A. Front-Set Style, Wind-Borne-Debris Resistance Tested:
   1. **Basis of Design**: TubeLite T14000 Series Thermally Broken.
   2. Vertical Mullion Dimensions: 2" x 4 1/2".

B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
   1. Coral Architectural Products, a division of Coral Industries, Inc: www.coralap.com.
   2. C.R. Laurence Company, Inc; U.S. Aluminum: www.crl-arch.com.
   3. EFCO, a Pella Company: www.efcocorp.com.
   4. Pittco Architectural Metals Inc: www.pittcometals.com.
   5. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com.
   6. YKK AP America Inc: www.ykkap.com.
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BASIS OF DESIGN -- SWINGING DOORS

A. Medium Stile, Insulating Glazing, Thermally-Broken:
   1. **Basis of Design**: TubeLite Thermal Medium Stile Entrance.
   2. Thickness: 1-3/4 inches.
   3. Bottom Rail: 10 inches.

B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
   1. Coral Architectural Products, a division of Coral Industries, Inc: www.coralap.com.
   2. C.R. Laurence Company, Inc; U.S. Aluminum: www.crl-arch.com.
   3. EFCO, a Pella Company: www.efcocorp.com.
   4. Pittco Architectural Metals Inc: www.pittcometals.com.
   5. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com.
   6. YKK AP America Inc: www.ykkap.com.
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.03 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Glazing Rabbet: For 1 inch insulating glazing.
   2. Sealed Insulating Glass Units: Vision glazing.
      a. Application(s): All exterior glazing unless otherwise indicated.
      b. Space between lites filled with air.
      c. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
         1) Tint: Clear.
         2) Coating: Low-E type, on #2 surface.
      d. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
         1) Tint: Clear.
         2) Coating: None, on #3 surface.
      e. Total Thickness: 1 inch.
      f. Thermal Transmittance (U-Value) - Center of Glass: 0.30, nominal.
      g. Solar Heat Gain Coefficient (SHGC): .30, nominal.
      h. Glazing Method: Gasket glazing.
   3. Water Leakage Test Pressure Differential: 10 lbf/sq ft.
   4. Air Infiltration Test Pressure Differential: 0,06 CFM /Ft.2 @ 6.24 psf.
   5. Finish Color: As selected by Architect from manufacturer's standard line.
   6. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   7. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   8. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   9. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
   10. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
   11. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Performance Requirements
   1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
      a. Design Wind Loads: Comply with requirements of the Building code of state in question.
      b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

2. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 5 gal. psf.
3. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.
4. Condensation Resistance Factor of Framing: 62, minimum, measured in accordance with AAMA 1503.
5. Overall U-value Including Glazing: .44 Btu/(hr sq ft deg F), maximum.
6. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
8. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

2.04 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   1. Framing members for interior applications need not be thermally broken.
   2. Glazing Stops: Flush.
   3. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
B. Glazing: See Section 08 8000.
C. Swing Doors: Glazed aluminum.
   1. Thickness: 1-3/4 inches.
   2. Top Rail: 4 inches wide.
   3. Vertical Stiles: 4 inches wide.
   4. Bottom Rail: 10 inches wide.
   5. Glazing Stops: Square.
   6. Finish: Same as storefront.

2.05 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).
B. Sheet Aluminum: ASTM B209/B209M.
C. Fasteners: Stainless steel.
D. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
E. Glazing Accessories: See Section 08 8000.

2.06 FINISHES

A. High Performance Organic Coatings: AAMA 2604; multiple coats, thermally cured fluoropolymer system.
   1. Manufacturers:
      a. Sherwin-Williams Company; Powdura 4000: industrial.sherwin-williams.com.
      b. Fluropon Kynar.
      c. Substitutions: See Section 01 6000 - Product Requirements.
B. Color: As selected by Architect from manufacturer's standard range.

2.07 HARDWARE

A. For each door, include weatherstripping, sill sweep strip, and threshold.
B. Other Door Hardware: See Section 08 7100.
C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.
F. Hinges: Butt type, swing clear; top and bottom.
   1. Provide on doors as indicated.
G. Exit Devices: Panic type.
   1. Provide on doors as indicated.
H. Door Closers: Concealed overhead.
   1. Provide on doors as indicated.
I. Locks: Dead latch with thumbturn inside; keyed cylinder outside.
   1. Provide on doors as indicated.

2.08 FABRICATION

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
C. Prepare components to receive anchor devices. Fabricate anchors.
D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
E. Arrange fasteners and attachments to conceal from view.
F. Reinforce components internally for door hardware and door operators.
G. Reinforce framing members for imposed loads.
H. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
   1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.
B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.
B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
C. Provide alignment attachments and shims to permanently fasten system to building structure.
D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
E. Provide thermal isolation where components penetrate or disrupt building insulation.
F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
H. Coordinate attachment and seal of perimeter air and vapor barrier materials.
I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
J. Set thresholds in bed of sealant and secure.
K. Install glass and infill panels using glazing method required to achieve performance criteria; see Section 08 8000.
L. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.05 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.
B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.
C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.
D. Remove excess sealant by method acceptable to sealant manufacturer.

3.06 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 5313 - VINYL WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vinyl-framed, factory-glazed windows.
B. Operating hardware.
C. Insect screens.
D. Perimeter sealant.

1.02 RELATED REQUIREMENTS

A. Section 07 2500 - WEATHER BARRIERS AND FLEXIBLE FLASHING: Sealing frames to water-resistive barrier installed on adjacent construction.
B. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.
C. Section 07 9005 - Joint Sealers: Perimeter sealant and back-up materials.
D. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2011.
B. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products; 2012.
C. AAMA 701/702 - Combined Voluntary Specifications for Pile Weatherstrip and Replaceable Fenestration Weatherseals; 2011.
D. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
E. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
F. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
G. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
H. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
I. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors; 2002 (Reapproved 2010).
J. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.
K. ASTM E1332 - Standard Classification for Rating Outdoor-Indoor Sound Attenuation; 2010a.
L. ASTM E1423 - Standard Practice for Determining the Steady State Thermal Transmittance of Fenestration Systems; 2014.
M. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2014, Revision 14A.
N. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2007.
O. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact; 2014.
P. ASTM F2090 - Standard Specification for Window Fall Prevention Devices with Emergency Escape (Egress) Release Mechanisms; 2021.
Q. FLA (PAD) - Florida Building Code Online - Product Approval Directory; Current Edition.
R. Miami (APD) - Approved Products Directory; Miami-Dade County; Current Edition.
S. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2014.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week week before starting work of this section.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide component dimensions, anchors, fasteners, glass, and internal drainage.
C. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, and installation requirements.
D. Samples: One full-size or partial-size showing window frame section.
E. Operating Hardware: Two samples of each type of operating hardware.
F. Manufacturer's Certificate: Certify that products of this section meet or exceed specified requirements.
G. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
    1. Evidence of AAMA Certification.
    2. Evidence of WDMA Certification.
    3. Evidence of CSA Certification.
    4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.
H. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.
I. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
J. Manufacturer's qualification statement.
K. Installer's qualification statement.
L. Specimen warranty.

1.06 MOCK UP
- A. Prior to proceeding with installation, provide mock up for approval of an installed window complete with weather barrier and perimeter flashing in place.
- B. Provide photographs of installed opening flashing prior to setting window.

1.07 QUALITY ASSURANCE
- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 5 years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified, with minimum 5 years of documented experience.

1.08 DELIVERY, STORAGE, AND HANDLING
- A. Protect finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.
- B. Jig, brace, and box the window frame assemblies for transport to minimize flexing of members or joints.

1.09 FIELD CONDITIONS
- A. Do not install sealants when ambient temperature is less than 40 degrees F.
- B. Maintain this minimum temperature during and after installation of sealants.

1.10 WARRANTY
- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective work within a 5-year period after Date of Substantial Completion.
- C. Provide 20 year manufacturer warranty for insulated glass units from seal failure, interpane dusting or misting, and replacement of same. Include coverage for degradation of color finish.
- D. Provide Lilfetime manufacturers warranty on frames and fabrication.

PART 2 PRODUCTS

2.01 MANUFACTURERS
- A. Vinyl Windows: Basis-of-Design Product: Subject to compliance with requirements, provide JeldWen Builders single hung vinyl windows (remodel) or comparable product by one of the following:
  1. Alside, Inc: www.alside.com.
  2. Innotech Windows and Doors: www.innotech-windows.com.
  3. Pella Corporation: www.pellacommercial.com.
  4. Prime Window Systems, LLC: www.primewindowsys.com.
  5. Quaker Window Products Company: www.quakercommercialwindows.com.
  6. Ply Gem Windows: www.plygem.com.
  7. Capitol Window and Door: www.captiowindowanddoor.com.
  8. Certainteed: www.certainteed.com.
  9. Silver Line Windows and Doors: www.silverlinewindows.com.
  10. Simonton Windows & Doors: www.simonton.com.
  11. Vinylmax Windows: www.vinylmax.com.
  12. M/I Windows and Doors: www.miwindows.com.
  13. Substitutions: See Section 01 6000 - Product Requirements.
    - a. Replacement:
      - 1) Single Hung: V-2500 Series.
      - 2) Sliding: 8700 Series.
      - 3) Casement: 70 Series.

2.02 DESCRIPTION
- A. Vinyl Windows: Factory-fabricated frame and sash members of extruded, hollow, ultraviolet-resistant, glass-fiber reinforced polyvinyl chloride (PVC) with integral color; with factory-installed glazing, hardware, related flashings, anchorage and attachment devices.
  1. Configuration: As indicated on drawings.
  2. Color: To match existing.
  3. Exterior Color: As selected by Architect from manufacturer's full line of colors.
  4. Size to fit openings with minimum clearance around perimeter of assembly providing necessary space for perimeter seals.
  5. Operable Units: Double weatherstripped.
  6. Framing Members: Fusion welded corners and joints, with internal reinforcement where required for structural rigidity; concealed fasteners.
  7. System Internal Drainage: Drain to exterior side by means of weep drainage network any water entering joints, condensation within glazing channel, or other migrating moisture within system.
  8. Glazing Stops, Trim, Flashings, and Accessory Pieces: Formed of rigid PVC, fitting tightly into frame assembly.
  9. Mounting Flange: Integral to frame assembly, providing weather stop at entire perimeter of frame.
  10. Insect Screens: Tight fitting for operating sash location.

2.03 PERFORMANCE REQUIREMENTS
- A. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
  1. Performance Class (PC):
  2. Performance Grade (PG): 40.
  3. Performance Grade (PG): Equivalent to or greater than specified design pressure.
- B. Design Pressure: In accordance with .

C. Condensation Resistance Factor: CRF of 60, minimum, the lower value of the glass and frame window components and determined in accordance with AAMA 1503.
D. Overall Thermal Transmittance: Windows to meet Energy Star Version 6.0. U-factor of [0.27] maximum, that includes window glazing and frame system based on average window size required for project and determined in accordance with AAMA 1503, ASTM E1423, or NFRC 100.; SHGC 0.3 or lower.
E. Forced Entry Resistance (FER): Tested to comply with ASTM F588 requirements having at least performance for each required window assembly.
F. Single and double hung windows shall have tilt sash feature for easy cleaning.
G. Accessibility Requirements for Operable Windows
    1. At Public Spaces:
        a. Counterbalance system shall be such so the required force to open and close windows is no more than 5 pounds of pressure.
        b. If the required force cannot be accomplished provide Window Ease window actuator with manual hand operation www.windowease.com.
H. Performance Requirements: Provide products that comply with the following:
    1. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
        a. Performance Class (PC): R.
        b. Performance Grade (PG): Equivalent to or greater than specified design pressure.
    2. Design Pressure: In accordance with applicable codes.
    3. Design Pressure (DP):
        a. Positive Design Wind Load: ____ psf.
        b. Negative Design Wind Load: ____ psf.
    4. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, tested by independent agency and passed in accordance with ASTM E1996 for Wind Zone 4 - Additional Protection for Large and Small Missile impact and pressure cycling at design wind pressure.
    5. Condensation Resistance Factor: CRF of 50, minimum, the lower value of the glass and frame window components and determined in accordance with AAMA 1503.
    6. Overall Thermal Transmittance: Windows to meet Energy Star Version 6.0. U-factor of [0.27] maximum, that includes window glazing and frame system based on average window size required for project and determined in accordance with AAMA 1503, ASTM E1423, or NFRC 100.; SHGC 0.3 or lower.
    7. Forced Entry Resistance (FER): Tested to comply with ASTM F588 requirements having at least Grade 10 performance for each required window assembly.
    8. Acoustical Performance: STC rating of 30, when tested in accordance with ASTM E90, ASTM E1425, or AAMA 1801 and ratings derived from ASTM E413 and ASTM E1332, respectively.
    9. Single and double hung windows shall have tilt sash feature for easy cleaning.
    10. Accessibility Requirements for Operable Windows
        a. At Public Spaces:
            1) Counterbalance system shall be such so the required force to open and close windows is no more than 5 pounds of pressure.
            2) If the required force cannot be accomplished provide Window Ease window actuator with manual hand operation as manufactured by Southwest Home Products LLC; 505-856-6632.
I. PATIO DOORS
    1. Perfomance:
        a. Structural Rating: R-PG35 (DP 35) - Test Size: 71 inches x 79 inches in accordance with ANSI/AAMA/NWWDA 101/I.S.2 /A440-08.
        b. Air Test Performance Requirements: a. Air infiltration maximum 0.30 cfm per square foot at 1.6 psf pressure differential when tested in accordance with ASTM E283 for sliding sealed products.
        c. Water Test Performance Requirements: a. No uncontrolled water leakage at 5.43 psf static pressure differential when tested in accordance with ASTM E331 and ASTM E547.
        d. Forced Entry: Grade 10 in accordance with ÅSTM F 588.
        e. Thermal Transmittance: The following values are in accordance with NFRC 100 and NFRC 200. a. U-Factor - 0.27
    2. Operation:
        a. One panel of the two-panel unit shall be movable. Operating panel shall glide on tandem metal adjustable wheels. Stationary panel shall be inserted head, jamb and sill, Panels shall have a positive interlock at the meeting stiles when in the closed position.
    3. Materials:
        a. All vinyl extrusions shall be rigid 100% virgin PVC. Frame profiles shall have a main wall thickness of 0.085”, & have sixteen tubular hollows for strength and thermal efficiency. Sash profiles rails shall have a main wall thickness of 0.080”, & have four tubular hollows for strength and thermal efficiency.
    4. Frame Construction:
        a. Frame shall have an integral pre-punched nailing fin along the perimeter. All corners shall be mitered and fusion welded. Metal door-sliding track & foot board. Frame depth shall be 4-5/8”.
    5. Sash Costruction:
        a. All sash corners shall be mitered and fusion welded. There shall be integral interlock at the meeting rail. Metal reinforcement bars shall be installed in meeting rails.
    6. Glazing:

a. Both sashes shall utilize 1.0” thick insulating glass consisting of two sheets of 1/8” thick clear tempered-proof glass and a desiccant filled metal spacer system SECTION 08560 08560-4 (intercept insulating unit), Jeld Wen "SunStable" Low E insulating glass . A butyl sealant shall be extruded around the entire perimeter of the spacer to achieve a seal. Movable sash shall be interior glazed, & fixed sash shall be exterior glazed, back bedded with silicone, and utilize dual durometer snap-in glazing beads.

7. Screen Construction:
   a. Screen shall cover the movable panel(s) area. The screen frame shall be aluminum extrusion with all corners keyed. The screen frame shall be fitted with 18” x 16” charcoal fiberglass mesh screen cloth or aluminum screen wire held-in-place with a flexible spline. Metal screen door-sliding track.
8. Hardware:
   a. Movable panel of standard product shall have an attractive cast locking handle/mortise lock set at one of its stiles by two color matched screws, white. Two adjustable steel tandem rollers shall be recessed into the bottom rail of movable panel.
9. Weatherstripping:
   a. High-density woven pile (double seal) shall be used in combination with continuous polyethylene rigid seal, & one Q-Lon seal between meeting stiles to minimize air infiltration.
10. Finish:
    a. Shall be solid vinyl in off white
11. Options:
    a. Grids- Colonial, Georgian, Applied, Prairie (Flat) and Diamond aluminum inglass grids in off white, beige or two tone colors are available. Handle with key lock, foot lock and brass handle with key-lock are optional. Glazing- duralite spacer glass units, Low-E tempered glass with argon filled can be used.

2.04 COMPONENTS

A. Glazing: Double glazed, clear, low-E coated, air filled, with glass thicknesses as recommended by manufacturer for specified wind conditions with SHGC of .30 or lower.
   1. Provide tempered glazing for any glass within 18" of finish floor or within 12" of the handle side of a passage door; bearing the tempered glass label; or otherwise comply with the latest requirements of the applicable building code.
B. Frames: Manufacturer's standard profile; flush glass stops of screw fastened type .
C. Sills: Manufacturer's standard thickness, extruded aluminum; sloped for positive wash; fit under sash to 1/2 inch beyond wall face; one piece full width of opening .
D. Divided Lite Grid: Installed between panes of insulating glass, 5/8 inch wide flat metal bars, color to match frame and sash.
   1. Pattern: Manufacturer's standard layout.
   2. Color: Match interior and exterior of frame.
E. Insect Screens: Aluminum, extruded or roll-formed frame with mitered and reinforced corners; apply screen mesh taut to frame; secure to window with hardware to allow easy removal.
   1. Hardware: Manufacturer's standard; quantity as required per screen.
   2. Screen Mesh: Vinyl-coated fiberglass, window manufacturer's 18 x 16 mesh.
   3. Frame Finish: Manufacturer's standard, color to match window frame and sash color.
F. Operable Sash Weatherstripping: Wool pile; permanently resilient, profiled to maintain weather seal in accordance with AAMA 701/702.
G. Fasteners: Stainless steel.
H. Accessories: Provide related flashings, anchorage and attachment devices as necessary for full assembly.
   1. Safety Device Stops: For operable windows, provide stops to prevent opening greater than 4 inches. Stops shall be manufacturer's standard for intended use and provided by the manufacturer.
I. Interior Window Sills: As indicated on drawings.
J. Sealants for Setting Window Sill Pan Flashing: Provide butyl tape, non-hardening butyl, polyurethane, or silicone sealant; in compliance with ASTM E2112 installation practices.

2.05 SEALANT MATERIALS

A. Perimeter Sealant and Backing Materials: As specified in Section 07 9200 - Joint Sealants.
B. Glazing Sealant: Type as specified in Section 08 8000 - Glazing.

2.06 HARDWARE

A. Double or single Hung Sash: Metal and nylon spiral friction slide cylinder, each sash, each jamb.
B. Sash lock: Lever handle and keeper with cam lock, provide one, minimum, for each operating sash.
   1. Comply with ADA Standards for operating hardware.
C. Sash lock at accessible designated units and all public spaces with operable windows: Provide locks with pull cord with plastic knob at base which releases lock. Upon closing of window lock shall automatically re-lock.
D. Tilt-and-Turn Sash: Multi-point locking hardware allowing sash to swing inward in one handle position, and for top to tilt inward in second position. Center position locks sash.
E. Window Opening Control Devices (WOCD): Provide operable window sash hardware that limits openings to only allow passage of 4-inch diameter rigid sphere or less, and is easily releasable to fully open without use of keys, tools, or special knowledge. Comply with ASTM F2090.
F. Finish of Exposed Hardware: Baked enamel, match interior sash and frame color.

2.07 **ATTIC STOCK**

A. Provide the following “attic stock” additional product materials at the conclusion of construction for storage on site by the owner:
   1. One (1) box of window screens - must provide a minimum of 3 screens for each window type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify wall openings and adjoining water-resistive barrier seal materials are ready to receive this work.

3.02 INSTALLATION

A. Install window unit assemblies in accordance with manufacturers instructions and applicable building codes.
B. Install windows in accordance with ASTM E2112.
C. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities as necessary.
D. Align window plumb and level, free of warp or twist, and maintain dimensional tolerances and alignment with adjacent work.
E. Set sill members and sill flashing in continuous bead of sealant.
F. Coordinate attachment and seal of perimeter air, vapor barrier and flashing materials.
G. Install operating hardware.
H. Install glass and infill panels in accordance with glazing method required to achieve performance criteria; see Section 08 8000.
I. Install perimeter sealant and backing materials in accordance with Section 07 9005. Apply continuous bead of sealant on backside of nailing flange before setting window.
J. Apply flexible window perimeter flashing in accordance with details on the drawings and the manufacturer's instructions adhering to whichever is more stringent.

3.03 TOLERANCES

A. Maximum Variation from Level or Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.

3.04 FIELD QUALITY CONTROL

A. Provide services of vinyl window manufacturer's field representative to observe for proper installation of system and submit report.
B. See Section 01 4000 - Quality Requirements for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
C. Provide field testing of installed vinyl windows by independent laboratory in accordance with AAMA 502 and AAMA/WDMA/CSA 101/I.S.2/A440 during construction process and before installation of interior finishes.
    1. Perform tests on three individual windows in designated locations as indicated on drawings.
    2. Conduct tests on individual windows prior to 5 percent and 50 percent completion of this work.
    3. Field test for water penetration in accordance with ASTM E1105 using Procedure B - cyclic static air pressure difference; test pressure shall not be less than 1.9 psf.
    4. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 6.27 psf.
        a. Maximum allowable rate of air leakage is 0.03 cfm/sq ft.
        b. Maximum allowable rate of air leakage is 1.5 times specified rate of 0.10 cfm/sq ft as indicated in AAMA/WDMA/CSA 101/I.S.2/A440.
D. Repair or replace fenestration components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 FIELD QUALITY CONTROL

A. Test installed windows for compliance with performance requirements for water penetration, in accordance with ASTM E1105 using uniform pressure and same pressure difference as specified for laboratory tests.

3.06 ADJUSTING

A. Adjust hardware for smooth operation and secure weathertight closure.

3.07 CLEANING

A. See Section 01 7419 - Construction Waste Management and Disposal for additional requirements.
B. Remove protective material from pre-finished surfaces.
C. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.
D. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer and appropriate for application indicated.

3.08 PROTECTION

A. Protect installed windows from damage.

END OF SECTION

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware for:
   a. Swinging doors.

2. Electronic access control system components, including:
   a. Electronic access control devices.

3. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 Section "Alternates" for alternates affecting this section.
2. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
3. Division 26 sections for connections to electrical power system and for low-voltage wiring.
4. Division 28 sections for coordination with other components of electronic access control system.

1.03 REFERENCES

A. UL - Underwriters Laboratories

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Key Systems and Nomenclature

C. ANSI - American National Standards Institute

1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

1.04 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.
2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, “EXAMINATION” article, herein.

B. Action Submittals:

1. Product Data: Technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
   a. Wiring Diagrams: For power, signal, and control wiring and including:
      1) Details of interface of electrified door hardware and building safety and security systems.
      2) Schematic diagram of systems that interface with electrified door hardware.
      3) Point-to-point wiring.
      4) Risers.

3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated, and tagged with full description for coordination with schedule.
   a. Samples will be returned to supplier. Units that are acceptable to Architect may,

after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:
   a. Door Index; include door number, heading number, and Architects hardware set number.
   b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
   c. Quantity, type, style, function, size, and finish of each hardware item.
   d. Name and manufacturer of each item.
   e. Fastenings and other pertinent information.
   f. Location of each hardware set cross-referenced to indications on Drawings.
   g. Explanation of all abbreviations, symbols, and codes contained in schedule.
   h. Mounting locations for hardware.
   i. Door and frame sizes and materials.
   j. Name and phone number for local manufacturer's representative for each product.
   k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include operational descriptions for: egress, ingress (access), and fire/smoke alarm connections.

      1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.

5. Key Schedule:
   a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
   b. Use ANSI/BHMA A156.28 “Recommended Practices for Keying Systems” as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
   d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
   e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
      1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
   f. Prepare key schedule by or under supervision of supplier, detailing Owner’s

final keying instructions for locks.

6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory or shop prepared for door hardware installation.

C. Informational Submittals:

1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
2. Product data for electrified door hardware:
   a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
3. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   b. Catalog pages for each product.
   c. Factory order acknowledgement numbers (for warranty and service)
   d. Name, address, and phone number of local representative for each manufacturer.
   e. Parts list for each product.
   f. Final approved hardware schedule, edited to reflect conditions as-installed.
   g. Final keying schedule
   h. Copies of floor plans with keying nomenclature
   i. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
   j. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.05 QUALITY ASSURANCE

A. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
   1. Warehousing Facilities: In Project's vicinity.
   2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
   3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
   4. Coordination Responsibility: Assist in coordinating installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.
      a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

B. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
   1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC).
   2. Can provide installation and technical data to Architect and other related subcontractors.
   3. Can inspect and verify components are in working order upon completion of installation.
   4. Capable of producing wiring diagrams.
   5. Capable of coordinating installation of electrified hardware with Architect and electrical engineers.

C. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

D. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire- rated door and door frame labels.

E. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

F. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in “REFERENCES” article, herein.

G. Keying Conference

   1. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      b. Preliminary key system schematic diagram.
      c. Requirements for key control system.
      d. Requirements for access control.
      e. Address for delivery of keys.

H. Pre-installation Conference

   1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   2. Inspect and discuss preparatory work performed by other trades.
   3. Inspect and discuss electrical roughing-in for electrified door hardware.
   4. Review sequence of operation for each type of electrified door hardware.
   5. Review required testing, inspecting, and certifying procedures.

I. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

1. Deliver each article of hardware in manufacturer's original packaging.

C. Project Conditions:

1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
2. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

D. Protection and Damage:

1. Promptly replace products damaged during shipping.
2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

1.07 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.08 WARRANTY

A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Beginning from date of Substantial Completion, for durations indicated.
   a. Closers:
      1) Mechanical: 10 years.
   b. Exit Devices:
      1) Mechanical: 3 years.
      2) Electrified: 1 year.
   c. Locksets:
      1) Mechanical: 3 years.
   d. Continuous Hinges: Lifetime warranty.
   e. Key Blanks: Lifetime

2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.09 MAINTENANCE

A. Maintenance Tools: Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: “No Substitute.”

1. Where “No Substitute” is noted, submittals and substitution requests for other products will not be considered.

B. Approval of manufacturers and/or products other than those listed as “Scheduled Manufacturer” or “Acceptable Manufacturers” in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

C. Approval of products from manufacturers indicated in “Acceptable Manufacturers” is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer’s product.

D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fasteners

1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
4. Install hardware with fasteners provided by hardware manufacturer.

B. Modification and Preparation of Existing Doors: Where existing door hardware is indicated to be removed and reinstalled.

1. Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.
2. Use materials which match materials of adjacent modified areas.
3. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.

C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

D. Cable and Connectors: Hardwired Electronic Access Control Lockset and Exit Device Trim:

1. Data: 24AWG, 4 conductor shielded, Belden 9843, 9841 or comparable.
2. DC Power: 18 AWG, 2 conductor, Belden 8760 or comparable.
3. Provide type of data and DC power cabling required by access control device manufacturer for this installation.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Ives 5BB series.
2. Acceptable Manufacturers and Products: Hager BB series, McKinney TA/T4A series.

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.

2. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:

    a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
    b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

3. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:

    a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
    b. Interior: Heavy weight, steel, 5 inches (127 mm) high

4. 2 inches or thicker doors:

    a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
    b. Interior: Heavy weight, steel, 5 inches (127 mm) high

5. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.

6. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

    a. Steel Hinges: Steel pins
    b. Non-Ferrous Hinges: Stainless steel pins
    c. Out-Swinging Exterior Doors: Non-removable pins
    d. Out-Swinging Interior Lockable Doors: Non-removable pins
    e. Interior Non-lockable Doors: Non-rising pins

7. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.

8. Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Provide one additional bearing hinge for each 30 inches (762 mm) of additional door height.

2.04 FLUSH BOLTS

A. Manufacturers:

    1. Scheduled Manufacturer: Ives.
    2. Acceptable Manufacturers: Burns, Rockwood.

B. Requirements:

    1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

1.1 2.05 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:
1. Scheduled Manufacturer and Product: Schlage ND series.
2. Acceptable Manufacturers and Products: No Substitutions.

B. Requirements:
1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3 hour fire doors.
2. Cylinders: Refer to “KEYING” article, herein.
3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw. Provide proper latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
7. Provide electrified options as scheduled in the hardware sets.
8. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides.
   Lever Design: Schlage - Athens (ATH)
   Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

CYLINDRICAL LOCKS – GRADE 2

A. Manufacturers:

1. Scheduled Manufacturer and Product: Schlage ALX Series
2. Acceptable Manufacturers and Products: No Substitutions.

B. Requirements

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 2, and UL L listed for 3-hour fire doors with a minimum cycle life of 1 million.
2. Cylinders: Refer to “KEYING” article, herein.
3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with ½ inch latch throw. Provide ¾” latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide a minimum of 5 points of lever engagement between the cassette spindle and lever shank to prevent level sag.
7. Provide standard ADA strikes unless extended lip strikes are necessary to protect trim.
8. Plug-n-Play – Provide modular lockset allowing lock functions to be created for 7 typical functions by inserting/installing parts into the exterior of a fully assembled chassis.
9. Reconfigurable Chassis – Provide modular lockset that allows the function to be Reconfigured by removing external components from the chassis.
10. Lever Trim: Solid cast levers and wrought roses on both sides.
    Lever Design: Schlage Athens

2.06 TUBULAR LOCKS – GRADE 2 AT UNITS

A. Manufacturers and Products:
   1. Scheduled Manufacturer and Product: Schlage F series.
   2. Acceptable Manufacturers and Products: No Substitutions.

B. Requirements:
   1. Provide tubular locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 2, Grade 2 and ANSI/BHMA A156.39 Residential Grade AAA, and UL Listed for 3 hour fire doors.
   2. Cylinders: Refer to “KEYING” article, herein.
   3. Provide locks with standard 2-3/8 inches (60 mm) adjustable to 2-3/4 inches (70 mm) backset with 1/2 inch (13 mm) latch throw. Provide 2-3/4 inches (70 mm) backset, unless 2-3/8 inches (60 mm) is required by door or frame detail, or noted otherwise.
   4. Provide locksets that fit standard 2-1/8 inches (54 mm) diameter bore without use of thru-bolts.
   5. Door Thickness: Locksets adjustable to fit in 1-3/8 inches (35 mm) or 1-3/4 inches (44 mm) door thickness.
   6. Provide standard T-strikes unless extended lip strikes are necessary to protect trim.
   7. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
      a. Lever Design: Schlage JAZ.

2.07 MORTISE LOCK

A. Manufacturers and Products:

   1. Scheduled Manufacturer and Product: Schlage L series.
   2. Acceptable Manufacturers: No Substitutions.

B. Requirements:

   3. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3 hour fire doors.
   4. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
   5. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to “KEYING” article, herein.
   6. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.
   7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
   8. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide a request to exit (RX) switch that is actuated with rotation of inside lever.
   9. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.

      a. Lever Design: Schlage 07.
      b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

2.09 AUXILIARY LOCKS

A. Deadbolts:

1. Manufacturers and Products:
   a. Scheduled Manufacturer and Product: Schlage B series.
   b. Acceptable Manufacturers and Products: No Substitutions.

2. Requirements:

   a. Provide deadbolt series conforming to ANSI/BHMA A156 and function as specified.
   b. Cylinders: Refer to “KEYING” article, herein.
   c. Provide deadbolts with standard 2-3/4 inches (70 mm) backset. Provide 2-3/8 inches (60 mm) where noted or if door or frame detail requires. Provide deadbolt with full 1 inch (25 mm) throw, constructed of steel alloy.
   d. Provide manufacturer’s standard strike.

2.10 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Falcon 24/25 series with deadlatching
2. Acceptable Manufacturers and Products: Sargent 80 series with deadlatching, Precision Apex series

B. Requirements:

1. Provide exit devices test to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit or Fire Exit Hardware. Cylinders: Refer to “KEYING” article, herein.
2. Exit Devices: Touchpad type, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
3. Touchpad: Extend minimum of one half of door width. Match ecit device finish or provide compatible finish. Provide compression springs in devices, latches, and outside trims or controls, tension springs also acceptable.
4. Provide devices with deadlatching feature for security and for future addition of alarm kits and other electrical requirements.
5. Provide manufacturer’s standards strikes.
6. Provide exit devices cut to door width and height. Locate exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
7. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
8. Provide cylinder dogging at non-fire-rated exit devices.
9. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
10. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that

will travel to 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.

a. Lever Style: Match lever style of locksets.

b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

11. Provide UL labeled fire exit hardware for fire rate openings.
12. Field drill weep holes per manufactuer's recommendation for exit devices used in full exterior application, highly corrosive areas, and where noted in the hardware sets.
13. Provide electrified options as scheduled the hardware sets.

2.10 CYLINDERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Falcon SFIC.
2. Acceptable Manufacturers and Products: No Substitute.

B. Requirements:

1. Provide cylinders/cores, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.

a. Conventional 6-Pin: cylinder with permanent 6-pin core with keys capable of working in full size key-in-lever/knob, and small format interchangeable core.

3. Nickel silver bottom pins.

C. Construction Keying:

1. Replaceable Construction Cores.

a. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.

1) 3 construction control keys
2) 12 construction change (day) keys.

2.11 KEYING

A. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.

   a. Master Keying system as directed by the Owner.

2. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.

3. Provide keys with the following features:

   a. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)

4. Identification:

   a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication “Keying Systems and Nomenclature” for identification. Do not provide blind code marks with actual key cuts.
   b. Identification stamping provisions must be approved by the Architect and Owner.
   c. Stamp cylinders/cores and keys with Owner’s unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with “DO NOT DUPLICATE” .
   d. Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.

5. Quantity: Furnish in the following quantities.

   a. Change (Day) Keys: 3 per cylinder/core.
   b. Permanent Control Keys: 3.
   c. Master Keys: 6.

2.12 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer: Telkee.
2. Acceptable Manufacturers: HPC, Lund.

B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.

   a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
   b. Provide hinged-panel type cabinet for wall mounting.

2.13 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Falcon SC70A series.
2. Acceptable Manufacturers and Products: LCN 4050 series, Norton 7500 series, Sargent 351 series.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with aluminum cylinder.
3. Closer Body: 1-1/2 inch (38 mm) diameter with 5/8 inch (16 mm) diameter heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.14 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Falcon SC80A series.
2. Acceptable Manufacturers and Products: LCN 1450 series, Norton 8000 series, Sargent 1331 series.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
2. Provide door closers with fully hydraulic, full rack and pinion action with aluminum cylinder.
3. Closer Body: 1-1/4 inch (32 mm) diameter, with 5/8 inch (16 mm) diameter heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.

5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.15 ELECTRO-HYDRAULIC AUTOMATIC OPERATORS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 4600 series.
2. Acceptable Manufacturers and Products: Norton 6000 series, Besam Power Swing.

B. Requirements:

1. Provide low energy automatic operator units with hydraulic closer complying with ANSI/BHMA A156.19.
2. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
3. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check, and opening and closing speed adjustment valves to control door
4. Provide units with on/off switch for manual operation, motor start up delay, vestibule interface delay, electric lock delay, and door hold open delay.
5. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check valve, sweep valve, latch valve to control door.
6. Provide drop plates, brackets, or adapters for arms as required for details.
7. Provide hard-wired actuator switches for operation as specified.
8. Provide weather-resistant actuators at exterior applications.
9. Provide key switches with LED's, recommended and approved by manufacturer of automatic operator as required for function described in operation description of hardware group below. Cylinders: Refer to "KEYING" article, herein.
10. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.
11. Provide units with vestibule inputs that allow sequencing operation of two units, and SPDT relay for interfacing with latching or locking devices.

2.16 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Hiawatha.

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:

a. Kick Plates: 8 inches (204 mm) high by 1-1/2 inches (38 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.17 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers: Glynn-Johnson.
2. Acceptable Manufacturers: Rixson, Sargent.

B. Requirements:

1. Provide heavy or medium duty and concealed or surface mounted overhead stop or holder for doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking wall, open against equipment, casework, sidelights, and where conditions do not allow wall stop or floor stop presents tripping hazard.
2. Where overhead holders are specified provide friction type at doors without closer and positive type at doors with closer.

2.18 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
3. Where wall or floor stop cannot be used, provide overhead stop.

2.19 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero International.
2. Acceptable Manufacturers: National Guard, Pemko.

B. Requirements:

1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Size of thresholds:

   a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
   b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width

4. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.20 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.21 MAGNETIC HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: LCN.
2. Acceptable Manufacturers: Rixson, Sargent.

B. Requirements:

1. Provide wall or floor mounted electromagnetic door release as specified with minimum of 25 pounds of holding force. Coordinate projection of holder and armature with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Connect magnetic holders on fire-rated doors into the fire control panel for fail-safe operation.

2.22 ROLLER CATCHES

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Engineered Products Company, Rockwood.

B. Requirements:

1. Provide catches with self-aligning magnets that can be surface mounted or mortised.
2. Provide catches in an aluminum case 1 inch wide x 3-1/8 inch long.

2.23 DOOR VIEWERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Provide appropriate door viewer for door type and rating with minimum of 180-degree view area.

2.24 LATCH PROTECTORS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Provide stainless steel latch protectors of type required to function with specified lock.

2.25 COAT HOOKS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Provide coat hooks as specified.

2.26 FINISHES

A. Finish: BHMA finish to match finish in hardware sets.

1.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.

C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

H. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as indicated in keying section.

I. Wiring: Coordinate with Division 26, ELECTRICAL sections for:

1. Conduit, junction boxes and wire pulls.
2. Connections to and from power supplies to electrified hardware.
3. Connections to fire/smoke alarm system and smoke evacuation system.
4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.

5. Testing and labeling wires with Architect's opening number.

J. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
K. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
L. Closer/Holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
M. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
N. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
O. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
P. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
Q. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 FIELD QUALITY CONTROL

A. Engage qualified manufacturer trained representative to perform inspections and to prepare inspection reports.

1. Representative will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.04 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, Installer's Architectural Hardware Consultant must examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.05 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.
B. Clean operating items as necessary to restore proper function and finish.
C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.06 DOOR HARDWARE SCHEDULE

A. Hardware items are referenced in the following hardware. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.

OPT0463680 Version 1

Hardware Sets:

HARDWARE GROUP NO. 01

FOR USE ON DOOR #(S):
U4A U4B

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	1011 3.5 X 3.5	646	IVE
1	EA	PASSAGE SET	F10 JAZ	619	SCH
1	EA	DOOR STOP	060 OR 70 AS REQ'D	619	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER
1			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 02

FOR USE ON DOOR #(S):
U2A U3A U3B

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	1011 3.5 X 3.5	646	IVE
1	EA	PRIVACY LOCK	F40 JAZ	619	SCH
1	EA	DOOR STOP	060 OR 70 AS REQ'D	619	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER
1			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 03

FOR USE ON DOOR #(S):
U1A

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4 X 4	646	IVE
1	EA	PASSAGE SET	ALX10 ATH	619	SCH
1	EA	SGL CYL DEADBOLT	B60N 12-321 10-116	619	SCH
1	EA	SURFACE CLOSER	SC81A DEL RW/PA	689	FAL
1	EA	DOOR STOP	060 OR 70 AS REQ'D	619	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	544A	A	ZER
2	EA	KNOCKER	02-3125 U700	619	IVE
1	EA	VIEWER	U700 [PROVIDE @ ACCESSIBLE UNITS]	626	IVE
1			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 04

FOR USE ON DOOR #(S):
E101 E125 E126 E223 E226

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGES	5BB1 4.5 X 4.5 [PER 08 71 00]	652	IVE
1	EA	STOREROOM LOCK	ALX80BDC ATH	626	SCH
1	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	SURFACE CLOSER	SC81A DEL RW/PA	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER
1			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 05

FOR USE ON DOOR #(S):

E130	E131	E132	E133	E230	E231
E232	E233	E330	E331	E332	E333

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGES	5BB1 4.5 X 4.5 [PER 08 71 00]	652	IVE
1	EA	STOREROOM LOCK	ALX80BDC ATH	626	SCH
1	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	DEL ACTION CLOSER	SC81A DEL SS	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER
1			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 06

FOR USE ON DOOR #(S):

E326

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGES	5BB1 4.5 X 4.5 [PER 08 71 00]	652	IVE
1	EA	STOREROOM LOCK	ALX80BDC ATH	626	SCH
1	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	SC81A DEL RW/PA	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER
1			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 07

FOR USE ON DOOR #(S):
141B 142B

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGE	5BB1 4.5 X 4.5 NRP [PER 08 71 00]	630	IVE
1	EA	PANIC HARDWARE	LD-25-R-EO-SNB	626	FAL
1	EA	SFIC HOUSING	RIM/MORTISE AS REQ'D	626	SCH
1	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	SURFACE CLOSER	SC71A SS	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER
1	EA	DOOR CONTACT	BY ACCESS CONTROL PROVIDER	628	SCE
1	EA	DOOR PROPPED ALARM	EAX-300W	GRY	DET
			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 08

FOR USE ON DOOR #(S):
134B

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGE	5BB1 4.5 X 4.5 NRP [PER 08 71 00]	630	IVE
1	EA	STOREROOM LOCK	L9080BDC 07A	630	SCH
1	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	LOCK GUARD	LG1	630	IVE
1	EA	SURFACE CLOSER	SC71A SS	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER
1	EA	DOOR CONTACT	BY ACCESS CONTROL PROVIDER	628	SCE
1			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 09

FOR USE ON DOOR #(S):
101

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	HINGE	5BB1 4.5 X 4.5 NRP [PER 08 71 00]	630	IVE
1	EA	AUTO FLUSH BOLT	FB31P/FB41P AS REQ	630	IVE
1	EA	DUST PROOF STRIKE	DP1/ DP2 (AS REQ'D)	626	IVE
1	EA	STOREROOM LOCK	L9080BDC 07A	630	SCH
1	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB [AS REQ'D]	689	IVE
2	EA	SURFACE CLOSER	SC71A SS	689	FAL
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
2	SET	MEETING STILE	328AA-S	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER
2	EA	DOOR CONTACT	BY ACCESS CONTROL PROVIDER	628	SCE
1			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 10

FOR USE ON DOOR #(S):
E141A E142A E241 E242 E341 E342

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGES	5BB1 4.5 X 4.5 [PER 08 71 00]	652	IVE
1	EA	FIRE EXIT HARDWARE	F-25-R-L-BE-AVA	626	FAL
1	EA	SURFACE CLOSER	SC81A DEL RW/PA	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER
1			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 11

FOR USE ON DOOR #(S):
221A 221B

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5 [PER 08 71 00]	652	IVE
2	EA	FIRE EXIT HARDWARE	F-25-C-L-LBR-AVA	626	FAL
2	EA	SFIC HOUSING	RIM/MORTISE AS REQ'D	626	SCH
2	EA	SFIC CORE	C606 SFIC	626	FAL
2	EA	SURFACE CLOSER	SC71A DEL HDPA	689	FAL
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
2	EA	MAGNET	SEM7800 SERIES AS REQ'D	689	LCN
1	EA	GASKETING	488S PSA H & J	BK	ZER
1	EA	ASTRAGAL	115NA (2 PC SET)	ALM	NGP

DOOR(S) NORMALLY HELD OPEN BY MAGNETIC HOLD OPEN(S). MAGNETIC HOLD OPEN(S) TIED TO FIRE ALARM SYSTEM. WHEN FIRE ALARM IS ACTIVATED, MAGNET(S) RELEASE, AND DOOR(S) CLOSE. DOOR(S) CAN ALSO BE MANUALLY RELEASED FROM MAGNET(S).

HARDWARE GROUP NO. 12

FOR USE ON DOOR #(S):
262 362

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGES	5BB1 4.5 X 4.5 [PER 08 71 00]	652	IVE
1	EA	PASSAGE SET	ALX10 ATH	626	SCH
1	EA	SURFACE CLOSER	SC81A DEL RW/PA	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER
1	EA	DOOR BOTTOM	355AA	AA	ZER

HARDWARE GROUP NO. 13

FOR USE ON DOOR #(S):
U5A U5B U5C U5D

PROVIDE EACH BP DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	BI-PASS DOOR HDW	118F SERIES (SIZE AS REQUIRED)	628	JOH

HARDWARE GROUP NO. 14

FOR USE ON DOOR #(S):
222

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGES	5BB1 4.5 X 4.5 [PER 08 71 00]	652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR	ND40S ATH OS-OCC	626	SCH
1	EA	SURFACE CLOSER	SC81A DEL RW/PA	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER

HARDWARE GROUP NO. 15

FOR USE ON DOOR #(S):
122

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGES	5BB1 4.5 X 4.5 [PER 08 71 00]	652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR	ND40S ATH OS-OCC	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	SC81A DEL RW/PA	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER

HARDWARE GROUP NO. 16

FOR USE ON DOOR #(S):
E123A E123B E134A

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGES	5BB1 4.5 X 4.5 [PER 08 71 00]	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	ALX50BDC ATH	626	SCH
1	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	SURFACE CLOSER	SC81A DEL RW/PA	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER
			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 17

FOR USE ON DOOR #(S):
224

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGES	5BB1 4.5 X 4.5 [PER 08 71 00]	652	IVE
1	EA	CLASSROOM LOCK	ALX70BDC ATH	626	SCH
1	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	SURFACE CLOSER	SC81A DEL RW/PA	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER

HARDWARE GROUP NO. 18

FOR USE ON DOOR #(S):
127

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP [PER TO 08 71 00]	630	IVE
1	EA	PANIC HARDWARE	CD-25-R-L-AVA-299F-SNB	626	FAL
2	EA	SFIC HOUSING	RIM/MORTISE AS REQ'D	626	SCH
2	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	SURFACE CLOSER	SC71A DEL SS	689	FAL
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER
1	EA	DOOR CONTACT	BY ACCESS CONTROL PROVIDER	628	SCE
1			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 19

FOR USE ON DOOR #(S):
264 265

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	HINGES	5BB1 4.5 X 4.5 [PER 08 71 00]	652	IVE
1	EA	CLASSROOM LOCK	ALX70BDC ATH	626	SCH
1	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	DEL ACTION CLOSER	SC81A DEL SS	689	FAL
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER

HARDWARE GROUP NO. 20

FOR USE ON DOOR #(S):
E151 E152 E251 E252 E351 E352

PROVIDE EACH DE DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 [PER 08 71 00]	652	IVE
2	EA	PUSH PLATE	8200 4" X 16"	630	IVE
2	EA	SURFACE CLOSER	SC81A DEL RW/PA	689	FAL
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	MAGNET	SEM7800 SERIES AS REQ'D	689	LCN
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER
			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 21

FOR USE ON DOOR #(S):
120A

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP [PER TO 08 71 00]	630	IVE
1	EA	PANIC HARDWARE	CD-25-R-NL-OP	626	FAL
1	EA	SFIC HOUSING	RIM/MORTISE AS REQ'D	626	SCH
1	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	90 DEG OFFSET PULL	8190EZHD 12" O	630-316	IVE
1	EA	SURFACE CLOSER	SC71A DEL SS	689	FAL
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER
1	EA	DOOR CONTACT	BY ACCESS CONTROL PROVIDER	628	SCE
			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 22

FOR USE ON DOOR #(S):
E120B

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 [PER 08 71 00]	652	IVE
1	EA	PANIC HARDWARE	CD-25-R-NL-OP	626	FAL
1	EA	SFIC HOUSING	RIM/MORTISE AS REQ'D	626	SCH
1	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	90 DEG OFFSET PULL	8190EZHD 12" O	630-316	IVE
1	EA	SURFACE CLOSER	SC71A DEL SS	689	FAL
1	EA	GASKETING	SR64/65 OR 488 SEALS AS REQUIRED	BK	ZER
			HDWE SUPPLIER/GC TO VERIFY COMPATIBILITY WITH EXISTING OPENING FOR NEW HDWE		

HARDWARE GROUP NO. 23

FOR USE ON DOOR #(S):
363

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR

HARDWARE BY TRASH CHUTE DOOR MANUFACTURER

HARDWARE GROUP NO. 24

FOR USE ON DOOR #(S):
260 261

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	SET	HINGE	5BB1 4.5 X 4.5 NRP [PER 08 71 00]	630	IVE
1	EA	DBL CYL DEAD LOCK W/ OUTSIDE INDICATOR W/ INSIDE INDICATOR	L462BD OS-LOC IS-LOC	626	SCH
2	EA	SFIC CORE	C606 SFIC	626	FAL
1	EA	PUSH/PULL BAR	9190HD-33"-12"-NO	630	IVE
1	EA	SURFACE CLOSER	SC71A DEL SS	689	FAL
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER
1	EA	NOTE	CUSTOM SIGNAGE PER OBC 1010.2.4.8		

- HARDWARE IS DESIGNED TO MEET OBC 2024 1010.2.4.8.
- TWO WAY COMMUNICATION REQUIRED AT OPENING.

END OF SECTION

SECTION 08 8000 - GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.
B. Glazing units.
C. Glazing compounds.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
B. Section 08 1433 - Stile and Rail Wood Doors: Glazed lites in doors.
C. Section 08 4313 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.
D. Section 08 5313 - Vinyl Windows: Glazing provided by window manufacturer.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).
E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
F. ASTM C1036 - Standard Specification for Flat Glass; 2021.
G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
H. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2019.
I. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
J. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2015.
K. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2012a.
L. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.
M. GANA (SM) - GANA Sealant Manual; 2008.
N. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
O. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2014.
P. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2014.
Q. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2014.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
D. Samples: Submit manufacturer's two samples of each type, thickness and coating.
E. Samples: Submit bead of glazing sealant, color to be selected by Architect.
F. Certificate: Certify that products of this section meet or exceed specified requirements.
G. Manufacturer's qualification statement.
H. Installer's qualification statement.
I. Fabricator's Certification: Submit fabricator's certification by manufacturer.
J. Cleaning Instructions: Submit manufacturer's cleaning instructions.
K. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with for glazing installation methods. Maintain one copy on site.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.
D. Fabricator's Qualifications:
   1. Minimum of 5 years experience manufacturing sealed insulating glass units meeting ASTM E 2190.
   2. Certified by coated glass manufacturer.

1.07 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 40 degrees F.
B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 and ICC's 2009 International Building Code by a qualified professional engineer, using the following design criteria:
   1. Design Wind Pressures: As indicated on structural Drawings.

1.09 Design Snow Loads: [As indicated on Drawings].

A. Safety Glazing: Provide safety glazing in the following applications.
   1. Glazing in swinging doors except jalousies.
   2. Glazing in fixed and sliding panels of sliding door assemblies and panels in sliding and bifold closet door assemblies.
   3. Glazing in doors and enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers. Glazing in any portion of a building wall enclosing these compartments where the bottom exposed edge of the glazing is less than 60 inches (1524 mm)above a standing surface.
   4. Glazing in an individual fixed or operable panel adjacent to a door where the nearest exposed edge of the glazing is within a 24-inch (610 mm) arc of either vertical edge of the door in a closed position and where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above the walking surface.
   5. Glazing in an individual fixed or operable panel, other than in those locations described in preceding Items 5 and 6, which meets all of the following conditions:
      a. Exposed area of an individual pane greater than 9 square feet (0.84 m2);
      b. Exposed bottom edge less than 18 inches (457 mm) above the floor;
      c. Exposed top edge greater than 36 inches (914 mm) above the floor; and
      d. One or more walking surface(s) within 36 inches (914 mm) horizontally of the plane of the glazing.
   6. Provide safety glazing in any other location as may be designated on the drawings.

1.10 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glass Fabricators:
   1. GGI - General Glass International: www.generalglass.com.
   2. JE Berkowitz, LP: www.jeberkowitz.com.
   3. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com.
   4. Viracon, Inc: www.viracon.com.
   5. Substitutions: See Section 01 6000 - Product Requirements.

B. Float Glass Manufacturers:
   1. AGC Glass Company North America, Inc: www.us.agc.com.
   2. Cardinal Glass Industries: www.cardinalcorp.com.
   3. **Basis of Design:** Guardian Glass, LLC: www.guardianglass.com.
   4. Pilkington North America Inc: www.pilkington.com/na.
   5. PPG Industries, Inc: www.ppgideascapes.com.
   6. Substitutions: See Section 01 6000 - Product Requirements.

C. Laminated Glass Manufacturers:
   1. Cardinal Glass Industries: www.cardinalcorp.com.
   2. **Basis of Design:** Guardian Glass, LLC: www.guardianglass.com.
   3. Viracon, Architectural Glass segment of Apogee Enterprises, Inc: www.viracon.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

D. Fire-Protection-Rated Glass: Provide products as required to achieve indicated fire-rating period.
   1. Fabricators:
      a. GGI - General Glass International; New Wire Glass: www.generalglass.com.
   2. Manufacturers:
   3. SAFTIFIRST, a division of O'Keeffe's Inc; SuperLite I-XL: www.safti.com.
   4. SCHOTT North America Inc; PYRAN Platinum 20: www.us.schott.com.
   5. Technical Glass Products: www.fireglass.com.
   6. Vetrotech North America; Contraflam 45: www.vetrotechusa.com.
   7. Substitutions: Refer to Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Design Pressure: Calculated in accordance with ASCE 7.
   2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
   3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
   4. Glass thicknesses listed are minimum.

B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
   1. In conjunction with weather barrier related materials described in other sections, as follows:

C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:

1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
2. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
3. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.

B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.

2.04 INSULATING GLASS UNITS

A. Manufacturers:
1. Glass: Any of the manufacturers specified for float glass.
2. Cardinal Glass Industries: www.cardinalcorp.com.
3. **Basis of Design:** Guardian Glass, LLC; SNX 62/27: www.guardianglass.com.
4. Pilkington North America Inc: www.pilkington.com/na/.
5. Viracon, Apogee Enterprises, Inc: www.viracon.com.
6. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com.
7. Substitutions: See Section 01 6000 - Product Requirements.

B. Fabricator: Certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.

C. Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
3. Metal-Edge Spacers: Aluminum, bent and soldered corners.
4. Spacer Color: White.
5. Edge Seal:
a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
6. Purge interpane space with dry air, hermetically sealed.

D. Insulating Glass Units: Vision glass, double glazed.
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
a. Tint: Clear.
b. Low-E Coating: SunGuard SNX 62/27, on #2 surface.
4. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
a. Tint: Clear.
b. Low-E Coating: SunGuard SNX 62/27, on #3 surface.
5. Total Thickness: 1 inch.
6. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.30, nominal.
7. Solar Heat Gain Coefficient (SHGC) for Storefront and Entrance Doors: 0.30, nominal.

E. Insulating Glass Units: Safety glazing.
1. Applications:
a. Glazed lites in exterior doors.
b. Other locations required by applicable federal, state, and local codes and regulations.
2. Space between lites filled with air.
3. Glass Type: Use fully tempered float glass for both outboard and inboard lites.
4. Tint: Clear.
5. Total Thickness: 1 inch.
6. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.30, nominal.
7. Solar Heat Gain Coefficient (SHGC): 0.30, nominal.

2.05 GLAZING COMPOUNDS

A. Glazing Putty: Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; gray color.

B. Polyurethane Sealant: Single component, chemical curing, nonstaining, nonbleeding; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 20 to 35; color as selected.

C. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; nonbleeding, nonstaining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

D. Manufacturers:
1. Bostik Inc: www.bostik-us.com.

2. Dow Corning Corporation: www.dowcorning.com/construction.
3. **Basis of Design:** Franklin International, Inc.: www.titebond.com.
4. Momentive Performance Materials, Inc: www.momentive.come.
5. Pecora Corporation: www.pecora.com.
6. Sika Corporation: www.usa-sika.com.
7. Tremco Commercial Sealants & Waterproofing; Proglaze SSG: www.tremcosealants.com.
8. Substitutions: See Section 01 6000 - Product Requirements.

2.06 ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

C. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to effect an air barrier and vapor retarder seal.

1. Manufacturers:
   a. Pecora Corporation: www.pecora.com.
   b. Saint-Gobain Performance Plastics: www.plastics.saint-gobain.com.
   c. Substitutions: See Section 01 6000 - Product Requirements.

D. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

E. Glazing Clips: Manufacturer's standard type.

F. Smoke Removal Window/Glazing Unit Markings: Adhesive backed markings affixed to manually operable or fixed windows of high-rise buildings to identify units intended for post-fire smoke removal in compliance with ICC (IBC) and local building officials.

2.07 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

3.04 FIELD QUALITY CONTROL

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

3.05 CLEANING

A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

B. Remove nonpermanent labels immediately after glazing installation is complete.

C. Clean glass and adjacent surfaces after sealants are fully cured.

D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

SECTION 08 8300 - MIRRORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass mirrors.

1. Annealed float glass.

1.02 RELATED REQUIREMENTS

A. Section 10 2800 - Toilet, Bath, and Laundry Accessories: Rooms.

1.03 REFERENCE STANDARDS

A. ASTM C1036 - Standard Specification for Flat Glass; 2021.

B. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

C. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2018.

D. GANA (GM) - GANA Glazing Manual; 2009.

E. GANA (SM) - GANA Sealant Manual; 2008.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data on Mirror Types: Submit structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM) and GANA (SM) for glazing installation methods.

1.06 FIELD CONDITIONS

A. Do not install mirrors when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for reflective coating on mirrors and replacement of same.

PART 2 PRODUCTS

2.01 MATERIALS

A. Mirror Design Criteria: Select materials and/or provide supports as required to limit mirror material deflection to 1/200, or to the flexure limit of glass, with full recovery of glazing materials, whichever is less.

B. Mirror Glass: Clear, annealed float glass; ASTM C1036, with copper and silver coatings, and protective overcoating.

1. Thickness: 1/4 inch.

2. Edges: Eased.

3. Size: As noted on drawings.

2.02 ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness.

C. Glazing Tape: Preformed butyl compound; 10 to 15 Shore A durometer hardness; on release paper.

D. Glazing Clips: Manufacturer's standard type.

E. Mirror Attachment Accessories: Stainless steel clips.

F. Mirror Adhesive: Silicone pre-polymer based, chemically compatible with mirror coating and wall substrate.

G. Channel Frame where indicated: One piece, channel frame, stainless steel, Type 430, satin finish, 1/2 inch by 1/2 inch by 3/8 inch deep with 90 degree mitered corners.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for mirrored glazing are correctly sized and within tolerance.

B. Verify that surfaces of mirror frames or recesses are clean, free of obstructions, and ready for installation of mirrors.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous mirror frames or recesses with substrate compatible primer or sealer. Prime surfaces scheduled to receive sealant.

C. Prepare installation in accordance with ASTM C1193 for solvent release sealants, and install sealant in accordance with manufacturer's instructions.

3.03 INSTALLATION

A. Set mirrors plumb and level, and free of optical distortion.

B. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

3.04 CLEANING

A. Remove wet glazing materials from finish surfaces.

B. Remove labels after work is complete.

C. Clean mirrors and adjacent surfaces.

3.05 PROTECTION

A. Protect installed mirrors from damage.

END OF SECTION

SECTION 08 9100 - LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Louvers, frames, and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 6200 - Sheet Metal Flashing and Trim.

B. Section 23 3100 - HVAC Ducts and Casings: Ductwork attachment to louversand blank-off panels.

1.03 REFERENCE STANDARDS

A. AMCA 511 - Certified Ratings Program Product Rating Manual for Air Control Devices; 2021.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.

C. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, and tolerances; head, jamb and sill details; blade configuration, screens, blank-off areas required, and frames.

D. Samples: Submit two samples 2 by 3 inches in size illustrating finish and color of exterior and interior surfaces.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Provide five year manufacturer's warranty against distortion, metal degradation, and connection failures of louver components.

1. Finish: Include twenty year coverage against degradation of exterior finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Louvers:

1. Airolite Company, LLC: www.airolite.com.
2. Greenheck: www.greenheck.com.
3. Ruskin Company; Louvers: www.ruskin.com.
4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 LOUVERS

A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.

1. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.
2. Screens: Provide insect screens at intake louvers and bird screens at exhaust louvers.

2.03 ACCESSORIES

A. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.

B. Bird Screen: Interwoven wire mesh of steel, 14 gauge, 0.0641 inch diameter wire, 1/2 inch open weave, diagonal design.

C. Insect Screen: 18 x 16 size aluminum mesh.

D. Fasteners and Anchors: Galvanized steel.

E. Flashings: Of same material as louver frame, formed to required shape, single length in one piece per location.

F. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared openings and flashings are ready to receive this work and opening dimensions are as indicated on shop drawings.

B. Verify that field measurements are as indicated.

3.02 INSTALLATION

A. Install louver assembly in accordance with manufacturer's instructions.

B. Install louvers level and plumb.

C. Set sill members and sill flashing in continuous bead of sealant.

D. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.

E. Secure louver frames in openings with concealed fasteners.

F. Coordinate with installation of mechanical ductwork.

3.03 CLEANING

A. Strip protective finish coverings.

B. Clean surfaces and components.

END OF SECTION

SECTION 09 0561 - COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Resilient tile and sheet.
   2. Broadloom carpet.
   3. Carpet tile.
   4. Thin-set ceramic tile and stone tile.

B. Preparation of new and existing concrete floor slabs for installation of floor coverings.

C. Testing of concrete floor slabs for moisture and alkalinity (pH).

D. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

E. Patching compound.

F. Remedial floor coatings.

G. Remedial floor sheet membrane.

H. Preparation of new and existing wood-based floors and subfloors for installation of new floor coverings.

1.02 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2024.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 2020.

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2021.

D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2016a.

E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.04 SUBMITTALS

A. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

B. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.
   6. Submit report to Architect.
   7. Submit report not more than two business days after conclusion of testing.

C. Adhesive Bond and Compatibility Test Report.

1.05 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
   1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.

C. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Provide access for and cooperate with testing agency.
   2. Confirm date of start of testing at least 10 days prior to actual start.
   3. Allow at least 4 business days on site for testing agency activities.
   4. Achieve and maintain specified ambient conditions.
   5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

D. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer’s instructions and recommendations.

B. Deliver materials in manufacturer’s packaging; include installation instructions.

C. Keep materials from freezing.

1.07 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
   1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
   2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
   3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
   4. Products:
      a. ARDEX Engineered Cements; ARDEX Feather Finish: www.ardexamericas.com/#sle.
      b. H.B. Fuller Construction Products, Inc; TEC Feather Edge Skim Coat: www.tecspecialty.com/#sle.
      c. USG Corporation; Durock Brand Advanced Skim Coat Floor Patch: www.usg.com/#sle.
      d. Substitutions: See Section 01 6000 - Product Requirements.

B. Remedial Floor Coating, Two-Component: Single-layer coating resistant to water vapor transmission meeting flooring manufacturer's emission limits, resistant to alkalinity (pH) level found, and suitable for flooring adhesion without further treatment.
   1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
   2. Products:
      a. ARDEX Engineered Cements; ARDEX MC RAPID: www.ardexamericas.com/#sle.
      b. Custom Building Products; TechMVC Moisture Vapor and Alkalinity Barrier: www.custombuildingproducts.com/#sle.
      c. H.B. Fuller Construction Products, Inc; TEC LiquiDam with TEC Level Set 200 SLU: www.tecspecialty.com/#sle.
      d. LATICRETE International, Inc; LATICRETE NXT Vapor Reduction Coating with LATICRETE NXT Level Plus: www.laticrete.com/#sle.
      e. Sika Corporation; Sikafloor Moisture Tolerance Epoxy Primer and Sikafloor Self-Leveling Moisture Tolerant Resurfacer: www.sikafloorusa.com/#sle.
      f. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Perform following operations in the order indicated:
   1. Preliminary cleaning.
   2. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
   3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   4. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   5. Specified remediation, if required.
   6. Patching, smoothing, and leveling.
   7. Other preparation specified.
   8. Adhesive bond and compatibility test.
   9. Protection.

3.02 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.03 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.04 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.
E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.
F. Report: Report the information required by the test method.

3.05 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
C. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
D. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.06 PREPARATION

A. See individual floor covering section(s) for additional requirements.
B. Comply with requirements and recommendations of floor covering manufacturer.
C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
D. Do not fill expansion joints, isolation joints, or other moving joints.

3.07 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

END OF SECTION

SECTION 09 2116 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.
B. Cementitious backing board.
C. Gypsum wallboard.
D. Joint treatment and accessories.
E. Textured finish system.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

A. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).
B. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2016).
C. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium).; 2017.
D. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.
F. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2020.
G. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.
H. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.
I. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2007a (Reapproved 2011).
J. ASTM C1288 - Standard Specification for Fiber-Cement Interior Substrate Sheets; 2017.
K. ASTM C1325 - Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units; 2014.
L. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
M. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2019, with Editorial Revision (2020).
N. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.
O. GA-216 - Application and Finishing of Gypsum Board; 2013.
P. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2008.
Q. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data:
   1. Provide data on gypsum board, glass mat faced gypsum board, accessories, and joint finishing system.
   2. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
C. Shop Drawings: Indicate special details associated with fireproofing.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 5 years of experience.

1.06 Delivery, Storage, and Handling

A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.
B. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.
B. Fire-Resistance-Rated Assemblies: Provide completed assemblies with the following characteristics:
   1. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.02 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. American Gypsum Company: www.americangypsum.com.
   2. CertainTeed Corporation: www.certainteed.com.
   3. Georgia-Pacific Gypsum: www.gpgypsum.com.
   4. Lafarge North America Inc: www.lafargenorthamerica.com.
   5. National Gypsum Company: www.nationalgypsum.com/#sle.
   6. PABCO Gypsum: www.pabcogypsum.com.
   7. Temple-Inland Building Product by Georgia-Pacific, LLC: www.temple.com.
   8. USG Corporation: www.usg.com.
   9. Substitutions: See Section 01 6000 - Product Requirements.
B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.

2. Glass mat faced gypsum panels, as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
   a. Use Glass-mat faced gypsum panels above shower surrounds from top of surround to ceiling.
3. Unfaced fiber-reinforced gypsum panels as defined in ASTM C1278/C1278M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
4. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
5. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly.

C. Backing Board For Wet Areas: One of the following products:
1. Application: Surfaces behind tile in wet areas including tub and shower surrounds.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
   a. Thickness: 1/2 inch.
   b. Products:
      1) Custom Building Products: www.custombuildingproducts.com.
      2) National Gypsum Company; PermaBase Brand Cement Board.
      3) National Gypsum Company; PermaBase Flex Brand Cement Board.
      4) USG Corporation: www.usg.com.
4. ASTM Cement-Based Board: Non-gypsum-based, cementitious board complying with ASTM C1288.
   a. Thickness: 1/2 inch.
   b. Products:
      1) James Hardie Building Products, Inc: www.jameshardie.com.
5. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
   a. Regular Type: Thickness 1/2 inch.
   b. Fire-Resistance-Rated Type: Type X core, thickness 5/8 inch.
   c. Products:
      1) Georgia-Pacific Gypsum; DensShield Tile Backer.
      2) National Gypsum Company; Gold Bond eXP Tile Backer.
      3) Temple-Inland Building Product by Georgia-Pacific, LLC; GreenGlass Tile Backer.

D. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
1. Application: Vertical surfaces behind thinset tile, except in wet areas.
2. Edges: Tapered.
3. Products:
   a. American Gypsum Company; M-Bloc.
   b. Georgia-Pacific Gypsum; ToughRock Mold-Guard Gypsum Board.
   c. Georgia-Pacific Gypsum; DensArmor Plus.
   d. National Gypsum Company; Gold Bond XP Gypsum Board.

E. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings, unless otherwise indicated.
2. Thickness: as indicated on drawings .
3. Edges: Tapered.

F. **Moisture resistant gypsum board:** Sizes to minimize joints in place; ends square cut.
1. Paper-Faced Sheathing: Gypsum sheathing board as defined in ASTM C1396/C1396M, moisture-resistant type with water repellent paper faces.
2. Core Type: Regular and Type X, as indicated.
3. Type X Thickness: 5/8 inch.
4. Regular Board Thickness: 1/2" and 5/8 inch as indicated.
5. Glass Mat Faced Products: Use where paper faced is indicated as not acceptable.
   a. CertainTeed Corporation; GlasRoc Brand.
   b. Georgia-Pacific Gypsum; DensGlass Sheathing.
   c. National Gypsum Company; Gold Bond eXP Sheathing.

G. Exterior Soffit Board: Exterior gypsum soffit board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings and soffits in protected exterior areas, unless otherwise indicated.
2. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
3. Types: Regular, in locations indicated.
4. Type X Thickness: 5/8 inch.
5. Regular Type Thickness: 1/2 inch.
6. Edges: Tapered.

2.03 GYPSUM BOARD ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3 5/8" inch.

B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
   1. Products:
      a. Franklin International, Inc; Titebond GREENchoice Professional Acoustical Smoke and Sound Sealant: www.titebond.com.
      b. Liquid Nails, a brand of PPG Architectural Coatings; AS-825 Acoustical Sound Sealant: www.liquidnails.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.
C. Finishing Accessories: ASTM C1047, extruded aluminum alloy (6063 T5) or galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.
   1. Types: As detailed or required for finished appearance.
D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
   2. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
   3. Joint Compound: Drying type, vinyl-based, .
   4. Joint Compound: Setting type, field-mixed.
E. Textured Finish Materials: Latex-based compound; plain.
   1. Primer: Of type recommended by texture finish manufacturer.
   2. USG Sheetrock Brand Ceiling Spray Texture-QT Poly, medium polystyrene aggregate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.03 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
   1. Exception: Tapered edges to receive joint treatment at right angles to framing.
C. Double-Layer, Nonrated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
D. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
E. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.
F. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.
G. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated double-layer assemblies, which may be installed by means of adhesive lamination.
H. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For nonrated assemblies, install as follows:
   1. Double-Layer Application: Install base layer using screws or nails. Install face layer using adhesive.
I. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
B. Corner Beads: Install at external corners, using longest practical lengths.

3.05 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.
B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   3. Level 3: Walls to receive textured wall finish.
   4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
   5. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.
C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.
D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
E. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.06 PENETRATIONS

A. Fill openings created by penetrating items in unrated assemblies and draftstopping. Where exposed, finish to match level of remaining wall.

3.07 TEXTURE FINISH

A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.

3.08 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 3000 - TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.
B. Tile for wall applications.
C. Cementitious backer board as tile substrate.
D. Ceramic accessories.
E. Ceramic trim.

1.02 RELATED REQUIREMENTS

A. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS

A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium).; 2017.
B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).
C. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2017.
D. ANSI A108.20 - American National Standard Specifications for Exterior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; 2020.
E. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2013 (Revised).
F. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2010 (Revised).
G. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2010 (Revised).
H. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes For Thin-Set Ceramic Tile And Dimension Stone Installation; 2014.
I. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-set Ceramic Tile and Dimension Stone Installation; 2014.
J. ANSI A118.13 - American National Standard Specifications for Bonded Sound Reduction Membranes for Thin-Set Ceramic Tile Installation; 2014.
K. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2019.
L. ANSI A136.1 - American National Standard for Organic Adhesives for Installation of Ceramic Tile; 2008 (Reaffirmed 2013).
M. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2013.1.
N. ASTM E492 - Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine; 2009, with Editorial Revision (2016).
O. ASTM E2179 - Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors; 2021.
P. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2015.
Q. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2023.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
D. Samples: minimum one sample per tile specificed illustrating pattern and color variations.
E. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. See Section 01 6000 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
B. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

1.06 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for additional requirements.
B. Construct tile mock-up incorporating components specified for location.
    1. Minimum size of mock-up is indicated on drawings.
    2. Mock-up may not remain as part of work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.
B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tile:
1. American Olean Corporation: www.americanolean.com/#sle.
2. Dal-Tile Corporation: www.daltile.com/#sle.
3. Substitutions: See Section 01 6000 - Product Requirements.

B. Grout:
1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
2. Custom Building Products: www.custombuildingproducts.com/#sle.
3. Mapei Corporation: www.mapei.com/#sle.

2.02 TILE

A. Manufacturers:
1. American Olean Corporation: www.americanolean.com/#sle.
2. Dal-Tile Corporation: www.daltile.com/#sle.
3. Substitutions: See Section 01 6000 - Product Requirements.

B. Ceramic Mosaic Tile, Glazed Wall Tile, Quarry Tile, Porcelain : ANSI A137.1, standard grade.

C. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated or specified on drawings.

2.03 TRIM AND ACCESSORIES

A. Ceramic Accessories: Glazed finish, same color and finish as adjacent field tile; same manufacturer as tile.

B. Ceramic Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.
1. Manufacturers: Same as for tile.

C. Non-Ceramic Trim: Satin brass anodized extruded aluminum, style and dimensions to suit application, set with tile mortar or adhesive.
1. Applications:
a. Open edges of wall and floor tile.
b. Inside and outside wall corners.
c. Transition between floor finishes of different heights.
d. Thresholds at door openings.
e. Floor-to-wall joints.
f. Borders and other trim as indicated on drawings.
2. Products:
a. Schluter-Systems: www.schluter.com/#sle.
b. Substitutions: See Section 01 6000 - Product Requirements.

2.04 SETTING MATERIALS

A. Manufacturers:
1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
2. Custom Building Products: www.custombuildingproducts.com/#sle.
3. LATICRETE International, Inc: www.laticrete.com/#sle.
4. MAPEI: www.mapei.com/us2.

B. Improved Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.
1. Products:
a. ARDEX Engineered Cements; S 28: www.ardexamericas.com/#sle.
b. Custom Building Products; Complete Contact-LFT Premium Rapid Setting Large Format Tile Mortar, with Multi-Surface Bonding Primer: www.custombuildingproducts.com/#sle.
c. LATICRETE International, Inc; LATICRETE 254 Platinum: www.laticrete.com/#sle.
2. MAPEI: Keraflex Super

C. Organic Adhesive: ANSI A136.1, thinset mastic type.
1. Use Type I in areas subject to prolonged moisture exposure.
2. Products:
a. ARDEX Engineered Cements; ARDEX D14: www.ardexamericas.com/#sle.
b. Custom Building Products; ReliaBond Ceramic Tile Adhesive - Type 1: www.custombuildingproducts.com/#sle.
c. LATICRETE International, Inc; LATICRETE 15 Premium Mastic: www.laticrete.com/#sle.
3. MAPEI: Type 1 Tile Adhesive.

2.05 GROUTS

A. Manufacturers:
1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
2. Custom Building Products: www.custombuildingproducts.com/#sle.
3. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: www.laticrete.com/#sle.
4. Merkrete, by Parex USA, Inc: www.merkrete.com/#sle.
5. TEC, an H.B. Fuller Construction Products Brand: www.tecspecialty.com/#sle.
6. MAPEI: www.mapei.com/us.

B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
1. Applications: Use where indicated on drawings and where no other type of grout is indicated.
2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.

3. Color: As indicated on drawings.
4. MAPEI: Ultracolor Plus FA
5. Products:
   a. ARDEX Engineered Cements; ARDEX FL: www.ardexamericas.com/#sle.
   b. Custom Building Products; Prism Color Consistent Grout: www.custombuildingproducts.com/#sle.
   c. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: www.laticrete.com/#sle.
   d. Merkrete, by Parex USA, Inc; Merkrete Pro Grout: www.merkrete.com/#sle.
   e. Substitutions: See Section 01 6000 - Product Requirements.

C. Standard Grout: ANSI A118.6 standard cement grout.
1. Applications: Use where indicated on drawings and where no other type of grout is indicated.
2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
3. Color: As selected by Architect from manufacturer's full line.
4. Products:
   a. Custom Building Products; Polyblend Non-Sanded Grout: www.custombuildingproducts.com/#sle.
   b. LATICRETE International, Inc; LATICRETE 1500 Sanded Grout: www.laticrete.com/#sle.
   c. Merkrete, by Parex USA, Inc; Merkrete Duracolor Non-Sanded Grout: www.merkrete.com/#sle.
   d. Substitutions: See Section 01 6000 - Product Requirements.

D. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
1. Applications: Use where indicated on drawings.
2. Color: As selected by Architect from manufacturer's full line.
3. Products:
   a. ARDEX Engineered Cements; ARDEX WA: www.ardexamericas.com/#sle.
   b. Custom Building Products; CEG-IG 100% Solids Industrial Grade Epoxy Grout: www.custombuildingproducts.com/#sle.
   c. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.
   d. Merkrete, by Parex USA, Inc; Merkrete Pro Epoxy: www.merkrete.com/#sle.
   e. Stuart Dean Company, Inc; Marcoat GS: www.stuartdean.com/#sle.

E. Stain Resistant Grout Additive: Liquid admixture for sanded and unsanded cement-based grouts; mix with dry grout material in place of water.
1. Applications: Use where indicated on drawings.
2. Products:
   a. H.B. Fuller Construction Products Inc. Grout Boost Advanced Pro; www.groutboost.com.
   b. Substitutions: See Section 01 6000 - Product Requirements.

2.06 Maintenance Materials

A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
1. Applications: Between tile and plumbing fixtures.
2. Color: As selected by Architect from manufacturer's full line.
3. Products:
   a. ARDEX Engineered Cements; ARDEX SX: www.ardexamericas.com/#sle.
   b. Custom Building Products; Commercial 100% Silicone Caulk: www.custombuildingproducts.com/#sle.
   c. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com/#sle.
4. MAPEI: Mapesil T

B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
1. Composition: Water-based colorless silicone.

2.07 ACCESSORY MATERIALS

A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
1. Crack Resistance: No failure at 1/8 inch gap, minimum.

B. Reinforcing Underlayment: Specifically designed for bonding to thin-set setting mortar; not primarily waterproofing material and having the following characteristics:
1. Sound Reduction: Comply with ANSI A118.13, ASTM E492, and ASTM E2179.
2. Water Resistance: Comply with ANSI A118.10, bonded waterproofing.
3. MAEPI: Mapesonic RM

C. Cementitious Backer Board: ANSI A118.9; High density, cementitious, glass fiber reinforced, 1/2 inch thick; 2 inch wide coated glass fiber tape for joints and corners. See Section 092116.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive tile.

B. Verify wall surfaces are smooth and flat within tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

3.02 Preparation

A. Vacuum clean surfaces and damp clean.
B. Seal substrate surface cracks with filler.
C. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to feather edge.
D. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108/A118/A136, manufacturer's instructions, and TCNA (HB) or TCNA (HB-GP) recommendations, as applicable.
B. Lay tile to pattern indicated on drawings. Do not interrupt tile pattern through openings.
C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
E. Form internal angles square and external angles bullnosed.
F. Install ceramic accessories rigidly in prepared openings.
G. Install non-ceramic trim in accordance with manufacturer's instructions.
H. Sound tile after setting. Replace hollow sounding units.
I. Keep control and expansion joints free of mortar, grout, and adhesive.
J. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
L. Grout tile joints unless otherwise indicated on drawings. Use standard grout unless otherwise indicated on drawings.
M. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.
N. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over exterior concrete substrates, install in accordance with TCNA (HB) Method F102, with standard grout.
B. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, on ground, with standard grout, unless otherwise indicated on drawings.
   1. Use uncoupling membrane under tile unless other underlayment is indicated on drawings.
   2. Where waterproofing membrane is indicated on drawings, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout, on ground.
C. Over wood substrates, install in accordance with TCNA (HB) Method F142, with standard grout, unless otherwise indicated on drawings.
D. Over wood substrates with backer board underlayment, install in accordance with TCNA (HB) Method F144, for cementitious backer boards, with standard grout.

3.05 INSTALLATION - SHOWERS AND BATHTUB WALLS

A. At tiled showers and bathtubs, install in accordance with TCNA (HB) Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls.
B. At bathtub walls with prefabricated receptors, install in accordance with TCNA (HB) Method B411, mortar bed on studs with waterproofing membrane.
C. Grout with standard grout.
D. Seal joints between tile work and other work with silicone type sealant specified in Section 07 9005.

3.06 INSTALLATION - WALL TILE

A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244C, using membrane at toilet rooms, kitchens, locker rooms, and _____.
B. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.
C. Over gypsum wallboard on wood or metal studs, install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat.
D. Over wood or metal studs without backer, install in accordance with TCNA (HB) Method W231/W241, mortar bed, with membrane where indicated on drawings.

3.07 CLEANING

A. Clean tile and grout surfaces.

3.08 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

3.09 Schedules

A. See drawings for specific tile products scheduled for installation.

END OF SECTION

SECTION 09 5100 - ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019.

C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2014.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate grid layout and related dimensioning.

C. Product Data: Provide data on suspension system components and acoustical units.

D. Samples: Submit two samples ____by____ inch in size illustrating material and finish of acoustical units.

1.04 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:

1. Armstrong World Industries, Inc: www.armstrong.com.

B. Suspension Systems:

1. Same as for acoustical units.

2.02 ACOUSTICAL UNITS

A. See drawings for product and manufacturer.

B. Acoustical Units - General: ASTM E1264,type III Class A.

1. Flame Spread Rating: 25 or less (ASTM E84). To meet Federal Spec. SS-S-118a, Class 25.
2. Comply with "Acoustical and Insulating Materials Association" (AIMA) "Performance Data Bulletin".
3. Provide panels that are sag resistant and manufactured for environment with humidity levels up to 100%.
4. Edge: Beveled tegular.
5. Surface Color: White.
6. VOC Content: Certified as Low Emission by one of the following :
   a. GreenGuard Children and Schools; www.greenguard.org.
   b. Product listing in the CHPS Low-Emitting Materials Product List at; www.chps.net/manual/lem_table.htm.

2.03 SUSPENSION SYSTEM(S)

A. See drawings for product and manufacturer.

B. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.

C. ExposedSteel Suspension System: Formed steel, commercial quality cold rolled; intermediate-duty.

1. Profile: Tee; 15/16 inch wide face.
2. Finish: White painted.

D. At vinyl faced panels use exposed Aluminum Suspension System Type ____: Extruded aluminum; intermediate-duty.

1. Profile: Tee; 15/16 inch wide face.
2. Finish: Painted white.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.

C. Perimeter Moldings: Same metal and finish as grid.

1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 Preparation

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

3.03 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, ASTM C636/C636M, ASTM E580/E580M, ASTM C636/C636M, and ASTM E580/E580M and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.
E. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
F. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
J. Do not eccentrically load system or induce rotation of runners.
K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.
   2. Overlap and rivet corners.

3.04 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.
B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
C. Fit border trim neatly against abutting surfaces.
D. Install units after above-ceiling work is complete.
E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
F. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.

3.05 ATTIC STOCK

A. Provide one additional box of replacement acoustical ceiling tile of each type to the owner for future use.

3.06 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 6500 - RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Static control resilient sheet flooring.
B. Resilient tile flooring.
C. Static control resilient tile flooring.
D. Resilient base.
E. Resilient stair accessories.

1.02 REFERENCE STANDARDS

A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2019a, with Editorial Revision (2020).
B. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2004 (Reapproved 2018).
C. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile; 2020.
D. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021.
E. ASTM F2034 - Standard Specification for Sheet Linoleum Floor Covering; 2018.
F. FS RR-T-650 - Treads, Metallic and Nonmetallic, Skid Resistant; Federal Specifications and Standards; Revision E, 1994.
G. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2019.
H. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2011.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
C. Shop Drawings: Indicate seaming plans and floor patterns.
D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
E. Verification Samples: Submit two samples, _6_x_9_ inch in size illustrating color and pattern for each resilient flooring product specified. For heat welding rod, submit manufacturer's standard sixe, but not less than 9 inches long, of each color specified.
F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Protect roll materials from damage by storing on end.

1.05 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Vinyl Tile (**vinyl plank**): Printed film type, with transparent or translucent wear layer.
    1. Manufacturers:
        a. Armstrong Flooring Inc; Natural Creations with Diamond 10 Technology ArborArt: www.armstrong.com/#sle.
        b. Patcraft; www.patcraft.com.
    2. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
    3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648, NFPA 253, ASTM E 648, or NFPA 253.
    4. Common Area: See Finish Key for Size and Thickness
        a. Wear Layer Thickness: 020 inch.
        b. Total Thickness: 096 inch.
    5. Living Units: See Finish Key for Size and Thickness
    6. Color: As indicated on drawings.

2.02 STAIR COVERING

A. Stair Tread / Riser Combination: Rubber tread with integrated riser for the visuially impaired; full width and depth of stair tread in one piece; tapered thickness; nosing not less than 1-5/8 inch deep.
    1. Manufacturers:
        a. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
        b. Roppe Corp: www.roppe.com/#sle.
    2. Minimum Requirements: Comply with FS RR-T-650 requirements corresponding to type specified.
    3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648, NFPA 253, ASTM E 648, or NFPA 253.
    4. Nominal Thickness: 0.1875 inch.
    5. Nosing: Square.
    6. Striping: 4 inch wide contrasting color abrasive strips.
    7. Color: As indicated on drawings.
    8. Manufacturers: Basis of design is Johnsonite, Inc; Product: standard raised round tread/riser visually impaired (virtr-rd): www.johnsonite.com. Other equivalent products are acceptable subject to approval from the Architect:

2.03 RESILIENT BASE

2.04 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
C. Moldings, Transition and Edge Strips: Same material as flooring.
D. Filler for Coved Base: Plastic.
E. Sealer and Wax: Types recommended by flooring manufacturer.

2.05 **ATTIC STOCK**

A. Provide the following “attic stock” additional product materials at the conclusion of construction for storage on site by the owner:
   1. All unused flooring materials to be left onsite - materials must be clearly labeled.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
   1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI (RWP).
B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
C. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
D. Prohibit traffic until filler is fully cured.

3.03 Installation - General

A. Starting installation constitutes acceptance of subfloor conditions.
B. Install in accordance with manufacturer's written instructions.

3.04 Installation - Sound Control Underlayment

A. Install in accordance with underlayment manufacturer's instructions.

3.05 Installation - Sheet Flooring

A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.
B. Seams are prohibited in bathrooms, kitchens, toilet rooms, and custodial closets.
C. Cut sheet at seams in accordance with manufacturer's instructions.
D. Seal seams by heat welding where indicated.

3.06 Installation - Tile Flooring

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.
B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.

3.07 Installation - Resilient Base

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
C. Install base on solid backing. Bond tightly to wall and floor surfaces.
D. Scribe and fit to door frames and other interruptions.

3.08 Installation - Stair Coverings

A. Install stair coverings in one piece for full width and depth of tread.
B. Adhere over entire surface. Fit accurately and securely.

3.09 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.
B. Clean in accordance with manufacturer's written instructions.

3.10 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09 6813 - TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet tile, fully adhered.

B. Removal of existing carpet tile.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tile Carpeting:

1. Patcraft; www.patcraft.com.

2.02 MATERIALS

A. Tile Carpeting, Type _____: Tufted, See Finish Key for Size and Color

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

3.02 PREPARATION

A. Remove existing carpet tile.

B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install carpet tile in accordance with manufacturer's instructions.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.

F. Trim carpet tile neatly at walls and around interruptions.

G. Complete installation of edge strips, concealing exposed edges.

END OF SECTION

SECTION 09 9000 - PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.
B. Field application of paints.
C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
   1. Walls, ceilings, base trim, casings, doors and frames.
   2. On roof where visible paint all pipes, ducts and chimneys that penatrate the roof to match roof color.
   3. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   4. Elevator pit ladders.
   5. Exposed surfaces of steel lintels and ledge angles.
   6. Prime surfaces to receive wall coverings.
   7. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes, unless otherwise indicated.
      b. In finished areas, paint shop-primed items.
D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   6. Marble, granite, slate, and other natural stones.
   7. Floors, unless specifically so indicated.
   8. Ceramic and other tiles.
   9. Glass.
   10. Acoustical materials, unless specifically so indicated.
   11. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 01 8113 - Sustainable Design Requirements

1.03 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2019.
C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.
D. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings; Fourth Edition.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Paint and Coatings: 1 gallon of each color.
   3. Label each container with color in addition to the manufacturer's label.
   4. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual, such as Sherwin-Williams “Custodian Project Color and Product Information” report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and by manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
B. The Sherwin-Williams Company. NCR's standards for interior and exterior paint specifications are through Sherwin-Williams. The Promar 400 series of products are the core standard for interior painting. The A-100 series of products are the core standards for exterior painting. Please notify/contact Ryan Schneeman (NCR's National Account Representative) for NCR standards/spec and to register as a NCR construction project.
    1. Contact information:
        a. Charles Jennison
        b. The Sherwin-Williams Company
        c. National Strategic Accounts Manager
        d. 216-566-1557 office
        e. 216-318-4792 cell
        f. charles.jennison@sherwin.com
C. Provide all paint and coating products from the same manufacturer to the greatest extent possible.
D. Paints:
    1. Base Manufacturer: Sherwin Williams Company.
E. Transparent Finishes:
    1. Base Manufacturer: Sherwin Williams Company.
F. Stains:
    1. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
G. Primer Sealers: Same manufacturer as top coats.
H. Block Fillers: Same manufacturer as top coats.
I. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
    1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
    2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
    3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
    4. Supply each coating material in quantity required to complete entire project's work from a single production run.
    5. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
C. Volatile Organic Compound (VOC) Content:
    1. Provide coatings that comply with the most stringent requirements specified in the following:
        a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
        b. Architectural coatings VOC limits of State in which the project is located.
    2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
E. Colors: To be selected from manufacturer's full range of available colors.
    1. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.
    2. Extend colors to surface edges; colors may change at any edge as directed by Architect.
    3. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.03 PAINT SYSTEMS - EXTERIOR

A. CONCRETE - (Cementitious Siding, Flexboard, Transite Board, Shingles (Non-Roof),Common Brick, Stucco, Tilt-up, Precast, and Poured-in-place Cement)
   1. Latex Systems
      a. Satin Finish
         1) 1st Coat: S-W Loxon Interior / Exterior Acrylic Masonry Primer, A24W8300 (8 mils wet, 3.2 dry)
         2) 2nd Coat: S-W A-100 Exterior Latex Satin, A82 Series
         3) 3rd Coat: S-W A-100 Exterior Latex Satin, A82 Series (4 mils wet, 1.4 mils dry per coat)
B. MASONRY (Concrete Masonry Units [CMU]- Cinder or Concrete Block)
   1. Latex Systems
      a. Semi-Gloss Finish
         1) 1st Coat: S-W PrepRite Block Filler, B25W25 (16 mils wet, 8 mils dry)
         2) 2nd Coat: S-W Metalatex Acrylic Semi-Gloss, B42 Series
         3) 3rd Coat: S-W Metalatex Acrylic Semi-Gloss, B42 Series (4 mils wet, 1.5 mils dry per coat)
C. CONCRETE- (Concrete Floors, Patios, Porches, Steps & Platforms)
   1. Acrylic System Water-Based
      a. Floor Finish
         1) 1st Coat: S-W Porch & Floor Enamel, A32-100 Series
         2) 2nd Coat: S-W Porch & Floor Enamel, A32-100 Series (4mils wet; 1.4 mils dry per coat)
         3) 1st Coat: S-W Sher-Crete Flexible Concrete Waterproofer, A5 Series
         4) 2nd Coat: S-W Sher-Crete Flexible Concrete Waterproofer, A5 Series (14-18 mils wet per coat)
D. METAL - (Aluminum, Galvanized)
   1. Latex Systems
      a. Gloss Finish
         1) 1st Coat: S-W A-100 Exterior Latex Gloss, A8W10051 Series
         2) 2nd Coat: S-W A-100 Exterior Latex Gloss, A8W10051 Series (4 mils wet, 1.3 mils dry per coat)
E. METAL - (Misc. Iron, Ornamental Iron, Structural Iron & Steel, Ferrous Metal)
   1. Latex Systems
      a. Gloss Finish
         1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (5-10 mils wet, 2-4 mils dry)
         2) 2nd Coat: S-W A-100 Exterior Latex Gloss, A8W10051 Series
         3) 3rd Coat: S-W A-100 Exterior Latex Gloss, A8W10051 Series (4 mils wet, 1.3 mils dry per coat)
F. WOOD- Decks, Exterior Trim (including pressure treated lumber) (Floors, Platforms)
   1. Acrylic Water-Based Floor System
      a. Floor Finish
         1) 1st Coat: S-W Porch & Floor Enamel, A32-100 Series
         2) 2nd Coat: S-W Porch & Floor Enamel, A32-100 Series (4mils wet; 1.4 mils dry per coat)
   2. Stain Systems
      a. Solid Color Acrylic Latex
         1) 1st Coat: S-W DeckScapes Ext. Acrylic Solid Color Deck Stain, A15-150 Series
         2) 2nd Coat: S-W DeckScapes Ext. Acrylic Solid Color Deck Stain, A15-150 Series (200-400 s/f per gal.)
      b. Semi-Transparent Stain
         1) 1st Coat: S-W DeckScapes Ext. Waterborne Deck Stain, A15T15 Series
         2) 2nd Coat: S-W DeckScapes Ext. Waterborne Deck Stain, A15T15 Series (100-300 s/f per gal)
      c. Clear Stain
         1) 1st Coat: S-W DeckScapes Ext. Waterborne Clear, A15T260
         2) 2nd Coat: S-W DeckScapes Ext. Waterborne Clear, A15T260 (150-300 sq/ft gal)
G. WOOD (Siding, Trim, Shutters, Sashes, Hardboard-Bare/Primed)
   1. Latex Systems
      a. Satin Finish
         1) 1st Coat: S-W A-100 Exterior Latex Wood Primer, B42W41 (4 mils wet, 1.4 mils dry)
         2) 2nd Coat: S-W A-100 Exterior Latex Satin, A82 Series
         3) 3rd Coat: S-W A-100 Exterior Latex Satin, A82 Series (4 mils wet, 1.4 mils dry per coat)
   2. Stain - Water Reducible Systems
      a. Semi-Transparent
         1) 1st Coat: S-W WoodScapes Polyurethane Stain, A15T5
         2) 2nd Coat: S-W WoodScapes Polyurethane Stain, A15T5 (100-350 sq ft/gal)
      b. Solid Color
         1) 1st Coat: S-W WoodScapes Solid Color Stain, A15 Series
         2) 2nd Coat: S-W WoodScapes Solid Color Stain, A15 Series (200-400 sq ft/gal)
H. ARCHITECTURAL PVC, PLASTIC, FIBERGLASS (due to the variety of substrate, check for compatibility)
   1. Latex Systems
      a. Satin Finish
         1) 1st Coat: S-W Multi-Purpose Latex Primer, B51-450 Series(4 mils wet, 1.4 mils dry)
         2) 2nd Coat: S-W A-100 Exterior Latex Satin, A82 Series
         3) 3rd Coat: S-W A-100 Exterior Latex Satin, A82 Series (4 mils wet, 1.4 mils dry per coat)
I. DRYWALL (Gypsum Board, Exterior Drywall)
   1. Latex Systems

a. Semi-Gloss Finish
1) 1st Coat: S-W Exterior Latex Wood Primer B42W81(4 mils wet, 1.4 mils dry)
2) 2nd Coat: S-W Metalatex Acrylic Semi-Gloss, B42 Series
3) 3rd Coat: S-W Metalatex Acrylic Semi-Gloss, B42 Series (4 mils wet, 1.5 mils dry per coat)
b. Satin Finish
1) 1st Coat: S-W Exterior Latex Wood Primer B42W81 (4 mils wet, 1.4 mils dry)
2) 2nd Coat: S-W A-100 Exterior Latex Satin, A82 Series
3) 3rd Coat: S-W A-100 Exterior Latex Satin, A82 Series (4 mils wet, 1.4 mils dry per coat)
c. Flat Finish
1) 1st Coat: S-W Exterior Latex Wood Primer B42W81(4 mils wet, 1.4 mils dry)
2) 2nd Coat: S-W A-100 Exterior Latex Flat, A6 Series
3) 3rd Coat: S-W A-100 Exterior Latex Flat, A6 Series (4 mils wet, 1.4 mils dry per coat)

J. VINYL SIDING* EIFS, SYNTHETIC STUCCO
1. Latex Systems
a. Satin Finish
1) 1st Coat: S-W A-100 Exterior Latex Satin, A82 Series
2) 2nd Coat: S-W A-100 Exterior Latex Satin, A82 Series (4 mils wet, 1.4 mils dry per coat)

2.04 PAINT SYSTEMS - INTERIOR

A. CONCRETE - (Walls & Ceilings, Poured Concrete, Precast Concrete, Unglazed Brick,Cement Board, Tilt-Up, Cast-In-Place)
B. Latex Systems
1. Semi-Gloss Finish
a. 1st Coat: S-W Loxon Concrete & Masonry Primer A24W8300 (7 mils wet, 3 mils dry)
b. 2nd Coat: S-W ProMar 400 Zero VOC Latex Semi-Gloss B31W4600
c. 3rd Coat: S-W ProMar 400 Zero VOC Latex Semi-Gloss B31W4600 (4 mils wet, 1.3 mils dry per coat)
C. Concrete Stain (Water Base)
1. Flat Finish Opaque
a. 1st Coat: S-W H&C Concrete Stain Solid Color Water Based
b. 2nd Coat: S-W H&C Concrete Stain Solid Color Water Based (50-300 sq/ft per gallon)
D. CONCRETE- FLOORS
1. Acrylic System
a. Gloss Finish
1) 1st Coat: S-W Porch & Floor Enamel, A32-100 series
2) 2nd Coat: S-W Porch & Floor Enamel, A32-100 series (4 mils wet, 1.4 mils dry)
3) Alternate
4) 1st Coat: S-W Sher-Crete Flexible Concrete Waterproofer, A5 Series
5) 2nd Coat: S-W Sher-Crete Flexible Concrete Waterproofer, A5 Series (14-18 mils wet per coat)
E. MASONRY - (CMU - Concrete, Split, Scored, Smooth, Fluted)
1. Latex Systems
a. Semi-Gloss Finish
1) 1st Coat: S-W PrepRite® Block Filler, B25W25 (75-125 sq ft/gal)
2) 2nd Coat: S-W ProMar 400 Zero VOC Latex Semi-Gloss B31W4600
3) 3rd Coat: S-W ProMar 400 Zero VOC Latex Semi-Gloss B31W4600 (4 mils wet, 1.3 mils dry per coat)
2. Concrete Stain (Water Base)
a. Flat Finish Opaque
1) 1st Coat: S-W H&C Concrete Stain Solid Color Water Based
2) 2nd Coat: S-W H&C Concrete Stain Solid Color Water Based (50-300 sq/ft per gallon)
F. METAL - (Aluminum, Galvanized)
1. Latex Systems
a. Gloss Finish
1) 1st Coat: S-W Pro Industrial Pro-Cryl® Primer, B66-310 Series (2-4 mils dry)
2) 2nd Coat: S-W ProMar® 400 Latex Gloss Enamel, B21W400 Series
3) 3rd Coat: S-W ProMar® 400 Latex Gloss Enamel, B21W400 Series (4 mils wet, 1.5 mils dry per coat)
b. Semi-Gloss Finish
1) 1st Coat: S-W Pro Industrial Pro-Cryl® Primer, B66-310 Series (2-4 mils dry)
2) 2nd Coat: S-W ProMar 400 Zero VOC Latex Semi-Gloss B31W4600
3) 3rd Coat: S-W ProMar 400 Zero VOC Latex Semi-Gloss B31W4600 (4 mils wet, 1.3 mils dry per coat)
c. Eg-Shel / Satin Finish
1) 1st Coat: S-W Pro Industrial Pro-Cryl® Primer, B66-310 Series (2-4 mils dry)
2) 2nd Coat: S-W ProMar 400 Zero VOC Latex Eg-Shel B20W4600
3) 3rd Coat: S-W ProMar 400 Zero VOC Latex Eg-Shel B20W4600 (4 mils wet, 1.5 mils dry per coat)
G. WOOD- (Walls, Ceilings, Doors, Trim,)
1. Latex Systems
a. Semi-Gloss Finish

1) 1st Coat: S-W SW Multi-Purpose Interior / Exterior Latex Primer B51-450 Series (4 mils wet, 1.4 mils dry)
2) 2nd Coat: S-W ProMar 400 Zero VOC Latex Semi-Gloss B31W4600
3) 3rd Coat: S-W ProMar 400 Zero VOC Latex Semi-Gloss B31W4600 (4 mils wet, 1.3 mils dry per coat)

b. Eg-Shel / Satin Finish
1) 1st Coat: S-W SW Multi-Purpose Interior / Exterior Latex Primer B51-450 Series (4 mils wet, 1.4 mils dry)
2) 2nd Coat: S-W ProMar 400 Zero VOC Latex Eg-Shel B20W4600
3) 3rd Coat: S-W ProMar 400 Zero VOC Latex Eg-Shel B20W4600(4 mils wet, 1.5 mils dry per coat)

2. At Wood Handrails:
a. 1st Coat: S-W SW Multi-Purpose Interior / Exterior Latex Primer B51-450 Series (4 mils wet, 1.4 mils dry)
b. 2nd and 3rd Coat: S-W B65W181 Hydrogloss Single Component Water Base Urethane

3. Stain & Varnish
a. Clear Finish
1) 1st Coat: S-W Minwax 250 VOC Oil Stain (Optional)
2) 2nd Coat: S-W Wood Classics® Waterborne Polyurethane Varnish, Gloss or Satin
3) 3rd Coat: S-W Wood Classics® Waterborne Polyurethane Varnish, Gloss or Satin (4 mils wet, 1.0 mil dry per coat)

4) 1st Coat: S-W Minwax 250 VOC Oil Stain (Optional)
5) 2nd Coat: S-W Minwax High Build Polyurethane, Gloss, Semi-Gloss, Satin
6) 3rd Coat: S-W Minwax High Build Polyurethane, Gloss, Semi-Gloss, Satin (4 mils wet, 1.3 mils dry per coat)

H. DRYWALL (Walls, Ceilings, Gypsum Board, Plaster Board, etc.)
1. Latex Systems
a. Gloss Finish
1) 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer B28W2600 (4 mils wet, 1.2 mils dry)
2) 2nd Coat: S-W ProMar® 400 Latex Gloss, B21W400 Series
3) 3rd Coat: S-W ProMar® 400 Latex Gloss, B21W400 Series (4 mils wet, 1.5 mils dry per coat)

b. Semi-Gloss Finish
1) 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer B28W2600 (4 mils wet, 1.2 mils dry)
2) 2nd Coat: S-W ProMar 400 Zero VOC Latex Semi-Gloss B31W4600
3) 3rd Coat: S-W ProMar 400 Zero VOC Latex Semi-Gloss B31W4600 (4 mils wet, 1.3 mils dry per coat)

c. Eg-Shel / Satin Finish
1) 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer B28W2600 (4 mils wet, 1.2 mils dry)
2) 2nd Coat: S-W ProMar 400 Zero VOC Latex Eg-Shel B20W4600
3) 3rd Coat: S-W ProMar 400 Zero VOC Latex Eg-Shel B20W4600(4 mils wet, 1.6 mils dry per coat)

d. Flat Finish
1) 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer B28W2600 (4 mils wet, 1.2 mils dry)
2) 2nd Coat: S-W ProMar 400 Zero VOC Latex Flat B30W4600
3) 3rd Coat: S-W ProMar 400 Zero VOC Latex Flat B30W4600 (4 mils wet, 1.4 mils dry per coat)

2.05 ACCESSORY MATERIALS
A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.
B. Patching Material: Latex filler.
C. Fastener Head Cover Material: Latex filler.
D. Wood Filler: Solvent base, tinted to match surface finish color.

2.06 **ATTIC STOCK**
A. Provide the following “attic stock” additional product materials at the conclusion of construction for storage on site by the owner:
1. All unused paint materials to be left onsite - materials must be clearly labeled

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
C. Test shop-applied primer for compatibility with subsequent cover materials.
D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
1. Gypsum Wallboard: 12 percent.
2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
4. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
D. Seal surfaces that might cause bleed through or staining of topcoat.
E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
F. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
G. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
H. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
I. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).
J. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
K. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
L. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
M. Interior Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.
N. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.
O. Exterior Wood to Receive Transparent Finish: Remove dust, grit, and foreign matter; seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes with tinted exterior calking compound after sealer has been applied. Prime concealed surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.
C. Apply products in accordance with manufacturer's instructions.
D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
E. Apply each coat to uniform appearance.
F. Sand wood surfaces lightly between coats to achieve required finish.
G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
H. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finished coatings until completion of project.
B. Touch-up damaged coatings after Substantial Completion.

END OF SECTION

SECTION 10 2600 - WALL AND DOOR PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Protective wall covering.

B. Door and frame protection.

1.02 RELATED REQUIREMENTS

A. Section 09 7200 - Wall Coverings: Terminating wall covering at wall and door protection.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Protective Wall Panels: Fiber Reinforced Plastic (FRP):

1. Marlite; www.marlite.com.

2.02 PRODUCT TYPES

A. Protective Wall Panels:

1. Material: Fiber Reinforced Plastic (FRP):
2. Thickness: 0.075 inch.
3. Panel Size: 3 feet by 8 feet.
4. Color and Pattern: As indicated on drawings.
5. Texture: As indicated on drawings.

2.03 FABRICATION

A. Fabricate components with tight joints, corners and seams.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

B. Verify that substrate surfaces for adhered items are clean and smooth.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.

END OF SECTION

SECTION 10 2800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Commercial toilet accessories.
- B. Residential toilet, shower, and bath accessories.

1.02 RELATED REQUIREMENTS
- A. Section 08 8300 - Mirrors: Other mirrors.
- B. Section 09 3000 - Tiling: Ceramic washroom accessories.

1.03 REFERENCE STANDARDS
- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- B. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip; 1999 (Reapproved 2009).
- C. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2015a (Reapproved 2019).
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- E. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- F. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017.
- G. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2018.

1.04 ADMINISTRATIVE REQUIREMENTS
- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS
- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

PART 2 PRODUCTS

2.01 MANUFACTURERS
- A. Basis of Design: Ferguson Kitchen & Bath.
  - 1. Contact: NCR@Ferguson.com
- B. Commercial Toilet, Shower, and Bath Accessories:
  - 1. American Specialties, Inc: www.americanspecialties.com.
  - 2. Bradley Corporation: www.bradleycorp.com.
  - 3. Georgia-Pacific Professional: www.blue-connect.com.

2.02 MATERIALS
- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
  - 1. Grind welded joints smooth.
  - 2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.
- B. Stainless Steel Sheet: ASTM A666/A666M, Type 304.
- C. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- D. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- E. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
- F. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES
- A. Stainless Steel: Satin finish, unless otherwise noted.
- B. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.

2.04 **TOILET ACCESSORIES**
- A. Living Units:
  - 1. Medicine Cabinet: Rangaire R615.
  - 2. Towel Bars (not over 30” in length): PROFLO PF6770ZBN.
  - 3. Toilet paper Holder - PROFLO PF6731ZBN, 6700 SERIES
  - 4. Robe Hook - PROFLO PF6741ZBN.
  - 5. Shower Curtain rod - DESIGNHOUS D564229.
  - 6. Grab bars - PROFLO 1 1/2" diameter (satin steel) with snap flanges (concealed fasteners).
    - a. At retrofit conditions without in-wall blocking, provide Winglts Grab Bar Fasteners.
  - 7. Shower Seats in Type A dwelling units.
    - a. For Bestbath shower LBS26333A75FTB: factory-installed folding seat.
    - b. For Aquatic shower A1363BFSDRWH: fold-up phenolic seat (factory installed); white.
  - 8. Shower Curtain:
    - a. Roll in shower units: Provide "Water Containment Shower Kit" by Bestbath; white waterstopper.
    - b. Curbed shower or shower/tub combo units: Provide heavy duty vinyl shower curtain; white.
  - 9. Mirror: Rangaire RWM2436BVBP5.
  - 10. In Type A dwelling units: PROFLO PFSAWB02ZBN - Install
- B. Public Bathrooms:

1. Paper towel dispenser - AJ Washroom U2304-S2.
2. Toilet Paper Holder - BOBRICK BB2888.
3. Robe Hook - PROFLO PF6741ZBN.
4. Grab bars - PROFLO 1 1/2" diameter (satin steel) with snap flanges (concealed fasteners).
    a. At retrofit conditions without in-wall blocking, provide WingIts Grab Bar Fasteners.
5. Mirror: Rangaire RWM2436BVBP5.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify exact location of accessories for installation.
C. Verify that field measurements are as indicated on drawings.

3.02 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
B. Install plumb and level, securely and rigidly anchored to substrate.
C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
D. Mounting Heights and Locations: As required by accessibility regulations, as indicated on drawings, and as follows:

END OF SECTION

SECTION 10 4400 - FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Fire extinguishers.
- B. Fire extinguisher cabinets.
- C. Accessories.

1.02 RELATED REQUIREMENTS
- A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCE STANDARDS
- A. NFPA 10 - Standard for Portable Fire Extinguishers; 2022.

1.04 SUBMITTALS
- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.
- C. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.05 FIELD CONDITIONS
- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS
- A. Fire Extinguishers:
  1. Ansul, a Tyco Business; Cleanguard: www.ansul.com/#sle.
  2. Pyro-Chem, a Tyco Business: www.pyrochem.com/#sle.
  3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fire Extinguisher Cabinets and Accessories:
  1. Ansul, a Tyco Business: www.ansul.com/#sle.
  2. AmeraProducts, Inc.: www.ameraproducts.com
  3. Larsen's Manufacturing Co: www.larsensmfg.com/#sle.
  4. Potter-Roemer: www.potterroemer.com/#sle.
  5. Pyro-Chem, a Tyco Business: www.pyrochem.com/#sle.

2.02 FIRE EXTINGUISHERS
- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
- B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
  1. Class: A:B:C type.
  2. Size: 10 pound.
  3. Finish: Baked polyester powder coat red color.
  4. Temperature range: Minus 40 degrees F to ___ degrees F.

2.03 **KITCHEN FIRE EXTINGUISHERS**
- A. Wet Chemical Type Fire Extinguishers: Stainless steel tank, with pressure gauge.
  1. Class: K type.
  2. Size: 1.6 gallons.
  3. Finish: Polished stainless steel.
  4. Temperature range: Minus 20 degrees F to 120 degrees F.

2.04 **FIRE EXTINGUISHER CABINETS**
- A. Fire Rating: Listed and labeled in accordance with ASTM E814 requirements for fire resistance rating of walls where being installed.
- B. Cabinet Construction: Non-fire rated at non fire rated walls.
  1. Formed primed steel sheet; 0.036 inch thick base metal.
- C. Cabinet Configuration: Semi-recessed type.
  1. Size to accommodate accessories.
  2. Trimless type.
  3. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim and door stiles.
- D. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinges.
- E. Door Glazing: Acrylic plastic, clear, 1/8 inch thick, flat shape and set in resilient channel glazing gasket.
- F. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.
- G. Fabrication: Weld, fill, and grind components smooth.
- H. Finish of Cabinet Exterior Trim and Door: No.4 - Brushed stainless steel.
- I. Finish of Cabinet Interior: White colored enamel.

2.05 ACCESSORIES
- A. Extinguisher Brackets: Formed steel, chrome-plated.
- B. Lettering: “FIRE EXTINGUISHER” decal, or vinyl self-adhering, prespaced black lettering in accordance with authorities having jurisdiction (AHJ).

PART 3 EXECUTION

3.01 EXAMINATION
- A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install cabinets plumb and level in wall openings, ____ inches from finished floor to inside bottom of cabinet.

C. Secure rigidly in place.

D. Place extinguishers in cabinets.

END OF SECTION

SECTION 10 5500 - POSTAL SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Central mail delivery boxes.

B. Fire rated rent drop box.

1.02 REFERENCE STANDARDS

A. 39 CFR 111 - U.S. Postal Service Standard 4C; Current Edition.

B. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; current edition; (ADA Standards for Accessible Design).

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's specifications and descriptive literature, installation instructions, maintenance information, and current USPS approval documentation.

C. Shop Drawings: Indicate plans for each unit or groups of units, front elevations with compartment layout and model number, overall dimensions, rough-in opening sizes, construction and anchorage details.

D. Samples: Submit two sets of manufacturer's available colors.

1.04 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's warranty against defects in materials or workmanship for a period of 5 years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 CENTRAL MAIL DELIVERY BOXES

A. Manufacturers:

1. **Basis of Design:** Florence Manufacturing Company: www.florencemailboxes.com.
2. Jensen Mailboxes: www.jensenmailboxes.com.
3. Postal Products Unlimited, Inc: www.postalproducts.com.
4. Salsbury Industries: www.mailboxes.com.
5. Security Manufacturing Corp: www.securitymanufacturing.com.
6. Substitutions: See Section 01 6000 - Product Requirements.

B. Central Mail Delivery Boxes: Provide products approved for United States Postal Service (USPS) delivery.

1. Materials: Aluminum with stainless steel hardware.
2. Finish: Powder coat in color selected by Architect from manufacturer's standard colors.
3. Unit Types and Sizes: As indicated on drawings.
4. Configurations: See drawings for overall dimensions and layouts.

C. Wall-Mounted Mailboxes: Fully-recessed, complying with 39 CFR 111 (USPS-STD-4C).

1. Front-loading with master door, double-column design, with 1 outgoing mail compartment, and 2 parcel compartments. See drawings for configuration.
   a. **Basis of Design:** Florence Manufacturing Company; 4CADD: www.florencemailboxes.com.
   b. Jensen Mailboxes .
   c. Postal Products Unlimited, Inc.
   d. Salsbury Industriesl.
   e. Security Manufacturing Corp.

2.02 RENT DROP BOX

A. Manufacturers:

1. **Basis of Design:** The Renz Group The Safety Letter Box Company LTD; Fire Rated 3 Mailbox: www.safetyletterbox.com.
2. Locking Security Mailbox; www.lockingsecuritymailbox.com.
3. Substitutions: See Section 01 6000 - Product Requirements.

B. Wall-Mounted: Horizontal in front / out back mailbox.

2.03 COMPONENTS

A. Locking - Front Loading Master Door: Three-point latching mechanism with USPS master lock furnished and installed by postmaster.

B. Locking - Customer Compartment Doors: USPS approved cam lock, 3 keys each lock.

C. Locking - Parcel Compartment Doors: Double-lock arrangement with USPS approved cam lock for customer access, and USPS master lock furnished and installed by postmaster.

D. Identification - Customer and Parcel Compartments: Sequential numerical or alphabetic characters, top to bottom, left to right; factory-installed.

1. Engraved characters, 3/4 inch high, with black fill.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough-openings are ready to receive wall-mounted units.

B. Do not begin installation until unacceptable conditions are corrected.

3.02 INSTALLATION

A. Install postal specialties in accordance with approved shop drawings, manufacturer's instructions, and USPS requirements.

B. Adjust and lubricate door hardware to operate properly.

END OF SECTION

SECTION 10 5723 - CLOSET AND UTILITY SHELVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall mounted wire closet shelving.

B. Accessories.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, with installation instructions.

C. Shop Drawings: Provide drawings prepared specifically for this project; show dimensions of shelving or storage system and attachment to substrates.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

C. Store flat to prevent warpage and bending.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Provide five year manufacturer warranty for wire shelving systems and laminated wood storage systems.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wire Storage Shelving:

1. ClosetMaid Corporation: www.closetmaid.com.
2. Organized Living: www.organizedliving.com.
3. Rubbermaid, Inc: www.rubbermaidpro.com.
4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 WIRE STORAGE SHELVING SYSTEMS

A. Applications:

1. Shelf Depth: 12 inches, unless otherwise indicated.
2. Bedroom Closets:
   a. Not less than 24 feet of shelving equipped with free sliding hanger rod; up to 12 feet may be arranged double height.
3. Coat Closets:
   a. Wall-to-wall shelf with integral hanger rod.
4. Linen Closets:
   a. Not less than 16 inch deep.
5. Storage Closets:
   a. Wall-to-wall storage shelves, not less than 12 inch deep.

B. Wire Shelving: Factory-assembled coated wire shelf assemblies for wall-mounting, with components and connections required to produce a rigid structure that is free of buckling and warping.

1. Construction: Cold-drawn steel wire with average tensile strength of 100,000 psi resistance welded into uniform mesh units, square, rigid, flat, and free of dents or other distortions, with wires trimmed smooth.
2. Coating: PVC or epoxy, applied after fabrication, covering surfaces.
3. PVC Coating: 9 to 11 mils thick.
4. Epoxy Coating: Nontoxic epoxy-polyester powder coating baked-on finish, 3 to 5 mils thick.
5. Standard Shelves: Wires spaced at 1 inch.
6. Shelf and Rod Units: Integral hanging rod at front edge of shelf.
7. Free-Sliding Hanging Rod: Integral hanging rod that permits uninterrupted sliding of hangers the full width of the shelf.
8. Corner Units: Same wire spacing as standard mesh shelves; provide wherever shelves meet at right angles.

C. Hanging Rod: Tubular steel, 1 inch diameter, with end caps on open ends.

D. Wall-Mounted Standards for Wire Shelving: Vertically slotted channel standards with double-tab cantilever brackets to suit shelving; factory finished to match shelving.

E. Mounting Hardware for Wire Shelving: Provide manufacturer's standard mounting hardware; include support braces, wall brackets, back clips, end clips, poles, and other accessories as required for complete and secure installation; factory finished to match shelving.

1. Provide intermediate support wall bracket for rod and shelf at any span 48 inches or more.

F. Fasteners: As recommended by manufacturer for mounting substrates.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect areas to receive shelving or storage system, to verify that spaces are properly prepared to receive shelf units, and are of dimensions indicated on shop drawings.

B. Verify appropriate fastening hardware.

C. Do not begin installation until substrates have been properly prepared.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install wire shelving in accordance with manufacturer's instructions, with shelf surfaces level.
B. Cap exposed ends of cut wire shelving.
C. Mounting Heights: See drawings.

3.04 CLEANING

A. Clean soiled surfaces after installation.

3.05 PROTECTION

A. Protect installed work from damage.
B. Touch-up, repair, or replace damaged products before Substantial Completion in a manner that eliminates evidence of replacement.

END OF SECTION

SECTION 11 3013 - RESIDENTIAL APPLIANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Kitchen appliances.

1.02 RELATED REQUIREMENTS

A. Section 22 1005 - Plumbing Piping: Plumbing connections for appliances.

B. Section 26 0583 - Wiring Connections: Electrical connections for appliances.

1.03 REFERENCE STANDARDS

A. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.

C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Electric Appliances: Listed and labeled by UL (DIR) and complying with NEMA Standards (National Electrical Manufacturers Association).

C. Gas Appliances: Bearing design certification seal of American Gas Association (AGA).

D. The owner, National Church Residences has a national purchase contract with Ferguson Kitchen & Bath. Contact the vendor representative to ensure national pricing is provided and product listings are correct: NCR@Ferguson.com.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's standard 1 year warrant on any part which fails due to a defect in materials or workmanship for refrigerators, ranges, cooktops, wall overs, microwaves, dishwashers and disposers. .

C. Provide five (5) year manufacturer warranty on sealed refrigeration system of refrigerators.

PART 2 PRODUCTS

2.01 KITCHEN APPLIANCES

A. All Equipment Eligible for Energy Star Rating shall be Energy Star Rated.

B. All ranges shall be provided with, and have installed an anti-tip bracket.

C. Apartment Units: Shall receive one each as follows: (all colors to be selected during construction)

1. Unit Refrigerator all units: GE Model # GTE17DTNRBB; 16.6 cubic ft top freezer refrigerator, Energy Star, ADA compliant.
   a. Acceptable Whirlpool Alternate: WRT134TFDB; 14" cubic ft. freezer refrigerator, Energy Star, ADA compliant.
2. Standard Unit Range: GE 30" free standing electric range, Model # JB256DMBB, 5.0 cubic ft oven capacity, standard clean.
   a. Acceptable Whilpool Alternate: WFC315SOJB; 30" free standing electric range, 4.8 cubic ft. oven capacity, self-cleaning technology.
3. Handicap Unit Range: GE 30" Drop-In elecric range, JD630DTBB, self clean oven, ceramic glass cooktop, front controls.
   a. Acceptable Whirlpool Alternate: WEE515SALB; 30" Slide-in electric range, self-clean oven, ceramic glass cooktop, front controls.
4. Grease Shield: Baked on enamel finish over steel to match color of range with matching fasteners. Model: Therm Pacific T3160032F.
5. Range Hood: Broan NuTone non-vented standard range hood, model # BF403023, convertible for ducted or recirculating conditions.
   a. At handicap unit provide remote switching as shown on electric drawings.
6. Dishwasher at Standard Units: GE Model # GDF510PGRBB, built in dishwashwer with 2 level wash system and two stage filtration.
   a. Acceptable Whirlpool Alternate: WDF330PAHB; built-in dishwasher with 2 level wash system and water filtration.
7. Dishwasher at Handicap Units: GE ADA compliant dishwasher Model # GDT225SGLBB, 3 level wash and autosense cycle.
   a. Acceptable Whirlpool Alternate: WDF550SAHB; ADA compliant dishwasher, 2 level wash and autosense cycle.
8. Provide two (2) Stove Top brand “FireStop” (contractor to supply Owner with expiration dates per unit) automatic fire suppression canisters in each apartment, mounted on underside of range hood one over each side of range top.
9. Disposal: Westcraft 12HPWC, 1/2 HP. Plug-in connection. Wire to wall switch.

D. Community Room Kitchen shall receive the following:

1. Refrigerator: Whirlpool Model WRS335SDHM Energy Star 25 cubic ft side-by-side, stainless steel, ADA Compliant.
2. Dishwasher: Whirlpool ADA compliant dishwasher Model # WDT550SAPZ, 3 level wash and autosense cycle.
3. Oven: Whirlpool Model WOES3030LS, electric single wall oven, self cleaning.
4. Microwave: Whirlpool Model WMCS7022SZ, countertop microwave, with MTK1630AZ trim kit.

5. Disposal: Westcraft 12HPWC, 1/2 HP. Plug-in connection. Wire to wall switch.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify utility rough-ins are provided and correctly located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.03 ADJUSTING

A. Adjust equipment to provide efficient operation.

3.04 CLEANING

A. Remove packing materials from equipment and properly discard.

B. Wash and clean equipment.

END OF SECTION

SECTION 12 2113 - HORIZONTAL LOUVER BLINDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Horizontal slat louver blinds.

B. Operating hardware.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

1.03 REFERENCE STANDARDS

A. WCMA A100.1 - Safety of Window Covering Products; 2018.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating physical and dimensional characteristics.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Horizontal Louver Blinds:

1. Draper Inc.
2. Hunter Douglas: www.hunterdouglas.com.
3. Levolor Contract: www.levolorcontract.com.
4. SWFcontract, a division of Spring Window Fashions, LLC.: www.swfcontract.com.
5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BLINDS

A. Description: Horizontal slat louvers hung from full-width headrail with full-width bottom rail.

B. Blinds: Horizontal slat louvers hung from full-width headrail with full-width bottom rail; manual control of raising and lowering by cordless with full range locking; blade angle adjustable by control wand; complying with WCMA A100.1.

C. Vinyl Slats: Vinyl, radiused slat corners.

1. Width: 1 inch.
2. Color: As indicated on drawings.
3. Texture: Smooth.

D. Slat Support: Woven polypropylene cord, ladder configuration.

E. Head Rail: Pre-finished, formed aluminum box, with end caps; internally fitted with hardware, pulleys, and bearings for operation; same depth as width of slats.

F. Bottom Rail: Pre-finished, formed PVC ; with end caps. Color: Same as headrail.

G. Control Wand: Extruded hollow plastic; hexagonal shape.

H. Headrail Attachment: Wall brackets.

2.03 **MANUALLY OPERATED WINDOW SHADES (provide at all common area exterior windows)**

A. Manufacturer's: Basis of design is Draper Flex Shades. Other acceptable manufacturer's offering equivalent products include:

1. Lotus
2. SWF Contract

B. FABRIC

1. Light-Filtering Fabrics

2.04 FABRICATION

A. Determine sizes by field measurement.

B. Fabricate blinds to fit within openings with uniform edge clearance of 1/4 inch.

C. Fabricate blinds to cover window frames completely.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings are ready to receive the work.

B. Ensure structural blocking and supports are correctly placed. See Section 06 1000.

3.02 INSTALLATION

A. Install window treatments in accordance with manufacturer's instructions.

B. Install window treatments level, plumb, square, and true. Allow proper clearances for window operation hardware.

C. Install the following items to conceal roller and operating mechanism. Do not use exposed fasteners.

1. Fascias.
2. Closure panels.
3. Endcaps.

D. Secure in place with flush countersunk fasteners.

E. Place intermediate supports per manufacturer's instructions.

3.03 TOLERANCES

A. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.

B. Maximum Offset From Level: 1/8 inch.

3.04 ADJUSTING

A. Adjust blinds for smooth operation.

3.05 CLEANING

A. Clean blind surfaces just prior to occupancy.

3.06 TESTING AND DEMONSTRATION

A. Demonstrate operation of shades to Owner's designated representatives.

END OF SECTION

SECTION 12 3530 - RESIDENTIAL CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Kitchen cabinets.
- B. Vanity cabinets.
- C. Casework hardware.

1.02 RELATED REQUIREMENTS
- A. Section 12 3600 - Countertops.
- B. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- C. Section 01 8113 - Sustainable Design Requirments.

1.03 REFERENCE STANDARDS
- A. BHMA A156.9 - Cabinet Hardware; 2020.
- B. KCMA A161.1 - Performance and Construction Standard for Kitchen and Vanity Cabinets; 2017.
- C. KCMA (DIR) - Directory of Certified Cabinet Manufacturers; Current Edition.

1.04 SUBMITTALS
- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, configurations, construction details, and joint details.
- C. Shop Drawings: Indicate casework locations, elevations, clearances required, rough-in and anchor placement dimensions and tolerances.

1.05 QUALITY ASSURANCE
- A. Products: Complying with KCMA A161.1 and KCMA Certified.

PART 2 PRODUCTS

2.01 MANUFACTURERS
- A. Residential Casework: Basis of design manufacturers listed below:
  - 1. Living Units: Georgetown as manufactured by Kountry Wood; Maple Slate finish.
  - 2. Common Areas: Georgetown as manufactured by Kountry Wood; finish per drawings.
  - 3. Other manufacturers offering equivalent products may be acceptable pending approval from the Architect:
    - a. Smart Cabinetry: www.smartcabinetry.com.
    - b. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS
- A. Cabinet Construction: Softwood lumber framing and particle board, tempered hardboard gables.
- B. Countertops: As specified in Section 12 3600.
- C. Door and Drawer Fronts: Solid wood.
- D. Bolts, Nuts, Washers and Screws: Of size and type to suit application.
- E. Concealed Joint Fasteners: Threaded steel.
- F. Special Components:
  - 1. Provide plumbing piping shield at common area vanities as detailed on the drawings to match cabinets.
  - 2. Provide vertical divider panels where shown to match cabinets at edge of dishwashers or other below counter spaces.

2.03 HARDWARE
- A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
- B. Adjustable Shelf Supports: Standard side/ back-mounted system using 1 inch spacing adjustments.
- C. Drawer and Door Pulls: Allison Amerock BP53003-G10.
- D. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish. Where shown on drawings.
- E. Drawer Slides:
  - 1. Type: Full extension.
  - 2. Static Load Capacity: Residential/Light Commercial grade.
  - 3. Mounting: Side mounted.
  - 4. Stops: Integral type.
  - 5. Features: Provide self closing/stay closed type.
- F. Hinges: European style concealed self-closing type, steel with satin finish.

2.04 FABRICATION
- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- B. Fabricate corners and joints without gaps.
- C. Form smooth edges. Form material for countertops, shelves, and drain boards from continuous sheets.
- D. Provide cutouts for plumbing fixtures and appliances. Prime paint contact surfaces of cut edges.
- E. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.05 FINISHES
- A. Exposed To View Surfaces: Stain, seal and varnish of selected color.
- B. Interior Surfaces:

PART 3 EXECUTION

3.01 EXAMINATION
- A. Verify adequacy of support framing.
- B. Field Measurements: Verify casework dimensions by field measurements confirming casework can be installed in compliance with the original design and referenced standards.

3.02 INSTALLATION
- A. Install casework, components and accessories in accordance with manufacturer's instructions.

B. Use anchoring devices to suit conditions and substrate materials encountered.
C. Set casework items plumb and square, securely anchored to building structure.
D. Carefully scribe casework abutting other components, with maximum gaps of _____ inch.
E. Close ends of units, back splashes, shelves and bases.

3.03 ADJUSTING

A. Adjust doors, drawers, hardware, and other moving or operating parts to function smoothly.

3.04 CLEANING

A. Clean casework, countertops, shelves, and hardware.

3.05 PROTECTION

A. Do not permit finished casework to be exposed to continued construction activity.

END OF SECTION

SECTION 12 3600 - COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for architectural cabinet work.
B. Countertops for manufactured casework.
C. Wall-hung counters and vanity tops.

1.02 RELATED REQUIREMENTS

A. Section 12 3530 - Residential Casework.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2016.
B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
E. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.
F. ISO 4586-2 - High-Pressure Decorative Laminates (HPL, HPDL) – Sheets Based on Thermosetting Resins (Usually Called Laminates) – Part 2: Determination of Properties; 2018.
G. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
H. NSI (DSDM) - Dimensional Stone Design Manual, Version VIII; 2016.
I. PS 1 - Structural Plywood; 2009 (Revised 2019).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Specimen warranty.
C. Shop Drawings: Complete details of materials and installation ; combine with shop drawings of cabinets and casework specified in other sections.
D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

1.05 QUALITY ASSURANCE

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.
B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 COUNTERTOPS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
B. Plastic Laminate Countertops: High-pressure decorative laminate (HPDL) sheet bonded to substrate.
   1. Laminate Sheet, Type ___: ISO 4586-2, Grade HGS, 0.031 inch nominal thickness.
   2. Laminate Sheet: NEMA LD 3, Grade HGS.
      a. Manufacturers:
         1) Formica Corporation; _____: www.formica.com/#sle.
         2) Wilsonart; _____: www.wilsonart.com/#sle.
      b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
      c. NSF approved for food contact.
      d. Finish: Matte or suede, gloss rating of 5 to 20.
      e. Surface Color and Pattern: As selected by Architect from the manufacturer's full line.
   3. Exposed Edge Treatment: Postformed laminate; front edge substrate built up to minimum 1-1/4 inch thick with raised radiused edge, integral coved backsplash with radiused top edge.
   4. Provide rounded outside corners.
   5. Back and End Splashes: Same material, same construction; except at handicap units which shall be self edge.
   6. Underside of countertops and all cutout edges: Seal with low VOC sealant; VOC Waterlox, by Waterlox Coatings Corporation; waterlox.com/originalvoc/
C. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.
   1. Flat Sheet Thickness: 1-1/4 inch, minimum.
   2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard stone fabrication tools; no surface coating; color and pattern consistent throughout thickness.
      a. Manufacturers:

Elevator Modernization Specifications
St. Theresa Village
6783 Siebern Avenua
Silverton, Ohio

Prepared For:
National Church Residences

Prepared By:

Elliott Elevator Consulting L.L.C.
Phone: 614-572-8198 Email:
tom@eecintl.org

Modernization of the following equipment:
Hydraulic Passenger Elevator

St. Theresa Village	
Elevator	35503
Capacity	2500
Speed FPM	125
Machine type	Hydraulic
Operation	Simplex
Platform	Retain
Cab Interior	Replace
Landings	3
Openings	3
Car Doors	Replace
Returns	Replace
Signal Fixtures	Replace
1. No logos	
2. Car operating panel	
3. Illuminated Push Buttons	
4. ADA Provisions	
5. Emergency Lighting and Fans	
6. Emergency power jewel if applicable	
7. Exhaust Fan	
8. Firefighter's Service	
9. Independent Service	
10. Finish to match existing	
Warranty/ Maintenance period 1 year -24 Hour Callbacks (RTCB and OTCB are covered) to start at the completion of the project	

1.0 GENERAL CONDITIONS

1.01RELATED DOCUMENTS

A. All work shall be subject to the provisions of the full specifications and contract documents and any addenda that may be issued as a result of project requirements.

B. Interim maintenance is to be provided in the base bid for the maintenance and repair of the additional equipment, this is to match the scope of the warranty scope.

1.02 REQUIREMENTS

A. A schedule shall be submitted with the bid. The schedule shall show all time frames from date of notice to proceed or signed contract. The schedule shall include the time required prior to start of actual modernization on jobsite, time duration of each phase of the modernization, and the expected time to have modernization site work finished. All times shall be from the signed contract date and not consecutive. Refer to the Schedule section of this specification for the sequence of work. The technicians shall remain on site until completion of the elevator scope of work.

B. No company insignia shall be visible on any exposed surfaces visible to the public.

C. Provide information on the proposed door operator type with the bid.

D. Provide information on the proposed control and signal logic with the bid.

E. Where clauses are repeated herein it shall be understood as calling attention to them or as a further qualification and shall not be construed as omitting any other part of the clause.

F. Any request for clarification of these specifications shall be directed to the Architect:

G. All materials needed to complete the work as provided for in the contract and the installation equipment shall be applied, used and installed in accordance with the standards and instructions provided by the manufacturer of such products to ensure that the terms and conditions of all applicable manufacturer warranties are provided.

1.03 SCOPE OF WORK

A. The scope of work covered in this specification includes the furnishing of all materials as listed in this specification and the installation of the materials for the modernization of the Passenger Elevators in existing shafts in an existing building. The speed of the elevator shall be as the original installation. Section 2.0 of these specifications will provide the details of new equipment to be provided and existing equipment to be reused. All equipment listed to be reused shall be coordinated with the new equipment to provide a complete installation. The reused equipment shall be inspected and refurbished to be in like new condition. Any equipment specified to be reused that is found to be worn excessively or in a condition that does not allow for compatibility with the new equipment shall be identified to the owner or their representative for the proper action to be determined and instructions given for such action.

B. The existing hoistway shall be reused. The travel and openings of all elevators shall remain the same for all existing elevators with all front openings on all elevators.

C. All modernization work shall be coordinated in such manner that the building will have minimum interruption of elevator service. All modernized elevators shall be completed and tested prior to releasing for public use and allowed to operate in service for a period of two days prior to permanent removal of the next phase of elevators from service for modernization.

1.04 QUALIFICATION OF BIDDER:

Any bidder, after opening of bids and before the award of contract, upon request by the owner, shall furnish satisfactory evidence that they have had previous experience and possesses an adequate plant, financial resources and organization to perform the type and quality of work specified and to complete the project within the time specified.

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1.05 EXAMINATION OF EXISTING BUILDING AND CONTRACT DOCUMENTS.

A. Bidder shall carefully examine existing building and make all necessary investigations required to inform themselves thoroughly and fully as to the facilities for delivering materials and equipment.

B. Each bidder shall examine specifications and all other data or instructions pertaining to the work. No pleas of ignorance of conditions that exist, or to difficulties or conditions that may be encountered or of any other matter concerning the work to be performed shall be accepted as an excuse for any failure or omission on the part of
the bidder to fulfill every detail of all the requirements of the documents governing the work. Bidder, if awarded the contract, shall not be allowed any extra compensation by reason of any matter or thing concerning which such bidder might have fully informed themselves prior to bidding, including increased costs which may occur during the contract period. Extra compensation due to delays caused by owner or others shall be negotiated, normally limited to materials and labor price indices.

C. When tendering proposal, Bidder shall give written notice to owner of any materials or apparatus which is in violation of laws ordinances, rules or regulations of all authorities having jurisdiction. If bidder fails to give such written notice, it shall be assumed that they have included the costs to remedy all such items in their proposal and shall be held responsible for satisfactory functioning and approval of entire installation without extra compensation.

1.06 EXPLANATIONS AND ADDENDA

1.06.1 Any bidder in doubt as to the true meaning of any part of the specifications or other proposed contract documents shall submit to the architect, a written request for an interpretation thereof. Any interpretation of the proposal documents shall be made only by an addendum duly issued by the architect

1.06.2 Any addenda issued up to and including the bid date shall be included in the bid price and any contract resulting from these specifications.

1.06.3 Any verbal information obtained from or statements made by owner, or their representative, at the time of examination of the documents or site shall not be construed as in any way

amending contract documents. Only such corrections or addenda as issued in writing to all bidders shall become part of the contract.

1.07 SUBSTITUTION OF MATERIAL OR EQUIPMENT

1.07.1 All bidders shall submit their proposals in strict accordance with materials mentioned in specifications as base bid.

1.07.2 Bidders may at their option submit substitutions based on materials or equipment other than that specified in the specifications

1.07.3 All substitutions and alternates must be submitted with base bid. In no event can substitutions or alternates be submitted unless a bid is also submitted in strict conformance with specifications of the base bid.

1.07.4 Bidder must state alternate's name, manufacture, type or brand of material or equipment and adjustment of costs from base bid with proposal.

1.07.5 Strict attention to the specification requirements regarding proprietary tools and diagnostic equipment, including the documentation, must be noted when submitting a substitute product.

1.07.6 Substitute materials or equipment, when approved, shall meet all requirements as to type, quality, and function as to that originally specified. Bidder shall submit upon request, complete engineering data to indicate comparable quality, design, and efficiency of alternate.

1.07.7 Acceptance of a substitute control, material or piece of equipment, shall be subject to approval of owner, or their representative and their decision shall be final.

1.08 REJECTION OF BIDS

1.08.1 Owner, or their representative, reserves and has the right to reject any or all of the bids, waiving of informalities and awarding of any bid.

1.09 LAWS AND PERMITS

1.09.1 Elevator Contractor shall comply with all federal, state, and municipal laws and ordinances in effect at the date of any contract from these documents. Elevator Contractor shall prepare all documents, give all notices, obtain all permits necessary to perform the work of this specification for Building Transportation equipment, pay all costs and fees for permits and inspections and obtain all certificates of inspection and approval for the work and deliver same to owner before requesting final or beneficial use acceptance.

1.09.2 If the Elevator Contractor performs any work contrary to any laws, ordinances, rules and regulations, Elevator Contractor shall bear all costs arising from such action, including, but not limited to, costs of reparation, correction and defense of prosecution. Elevator Contractor is required to provide owner with copies of such required permits and licenses. Owner shall reasonably assist Elevator Contractor, when necessary, in obtaining such permits and licenses.

1.10 ASSIGNMENT

1.10.1 The successful bidder selected to do the work set forth herein shall not assign all or any part of said work without prior approval of the owner. Such approval, when given, shall be within a reasonable length of time.

1.11 SUBCONTRACTS

1.11.1 Elevator Contractor shall submit for approval all sub–Elevator Contractors to be used in the performance of the work covered by these specifications. Such approval, when given, shall be within a reasonable length of time and not withheld without a just reason.

1.11.2 Elevator Contractor shall not reassign any approved subcontract to another sub– Elevator Contractor without providing to the owner a reason and written approval by the owner.

1.12 CONFLICTS

1.12.1 Should it appear that there is real or apparent discrepancy between different sections of specifications concerning intent, quality or extent of work to be furnished, it shall be assumed that Elevator Contractor has based their bid on completing the work in the more stringent method. Final decision shall rest with the owner or their representative.

1.13 CONDUCT AT SITE

1.13.1 Personnel shall be instructed to refrain from unprofessional conduct while on the jobsite. Elevator Contractor shall, at all times, maintain good discipline and order at the jobsite. The owner shall expect the assigned lead mechanic, or foreman, assigned to
the site to maintain proper appearance and conduct of other personnel. No smoking or alcoholic beverages of any type will be allowed on site.

1.13.2 Any personnel removed from the site for violation of the before mentioned conduct shall not be allowed to return for further work on the site without approval of the owner.

1.14 UNION REGULATIONS

1.14.1 Elevator Contractor shall work in harmony with other labor unions or permanent building personnel performing work on the site and shall be responsible for any delays or damages caused by their failure to do so.

1.15 ROYALTIES AND LICENSE FEES

1.15.1 Elevator Contractor shall pay all royalties and license fees associated with the equipment provided or work required. They shall defend all suits or claims for royalty rights and shall save the owner harmless from loss thereof. The Elevator Contractor

is responsible for all licenses required or costs thereof to perform the requirements of the elevator portion of this specification.

1.15.2 The Elevator Contractor shall grant any software license required for the sole use of the software in the equipment furnished by Elevator Contractor to the owner.

1.16 INTENT

1.16.1 Intent of these specifications is to cover the specified work complete and operable in every aspect. It is not intended to give every detail in the specifications. Elevator Contractor shall furnish all materials and equipment usually furnished with the provided system or needed to make a complete and safe operating installation,
whether specifically mentioned or not.

1.16.2 All material and equipment furnished shall be new and in perfect condition.

1.16.3 Owner, or their representative's, interpretation of specifications shall be final and binding upon bidder.

1.17 DEFINITION OF WORK

1.17.1 The work to be performed shall include all labor, equipment, material, and services necessary to comply with these specifications and provide a complete installation. All work shall pertain to all elevators listed unless otherwise noted.

1.17.2 Definitions:

1. "Provide": To supply, install, connect and make ready for safe and normal operation the complete elevator system as specified herein.

2. "Install": To erect, mount, and connect complete with related accessories.

3. “Supply”: To purchase, procure, acquire and deliver a complete system.

4. “Work”: Labor, equipment and other items required for proper and complete installation.

5. “Wiring”: Conduit, fittings, wire, traveling cables, junction and outlet boxes, switches, receptacles, and other related wiring items.

6. “Similar” or “Equal”: Approved material, weight, size, design and operating characteristics to the specified product.

7. “Approved”, “Satisfactory”, “Accepted”, or “Directed”: As approved, satisfactory, accepted or directed by owner or their designated representative or agent.

8. “Owner”: Shall be defined as person or company holding title to property in which this specified work is to be performed. When reference is made to the owner’s representative as the authorized person or company at any place in this specification, then it is implied that the term “owner” shall include the representative at all times, whether specifically written or not written.

9. “Representative” or “Agent”: The authorized person employed by the owner to handle the project or any part of the document preparation.

10. “Elevator Contractor”: Shall be defined as the elevator company contracted to perform the work described in these specifications.

11. “Building Transportation” shall be defined as elevators, escalators, dumbwaiters, and moving power walks.

1.18 PROTECTION OF PERSONS AND PROPERTY

1.18.1 The Elevator Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and

programs in connection with its work in accordance with the safety requirements of the General Contractor.

1.18.2 The Elevator Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

1. All employees on the project and all other persons affected thereby.

2. All the work and all materials and equipment to be incorporated therein, whether in storage on or off the site or under the care, custody or control of sub–Elevator Contractors.

1.18.3 The Elevator Contractor shall comply with all applicable laws, ordinances, rules, regulation and lawful orders of any public authority having jurisdiction over the safety of persons or property or to protect them from damage, injury or loss. They shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, including posting of danger signs, barricades to protect adjacent occupied space or work areas, and other warning against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

1.18.4 The Elevator Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Elevator Contractor's superintendent unless otherwise designated in writing by the Elevator Contractor to the General Contractor.

1.18.5 The Elevator Contractor shall not load or permit any part of the work to be loaded so as to endanger the safety of the building or occupants.

1.18.6 In any emergency affecting the safety of persons or property, the Elevator
Contractor shall act, at his discretion, to prevent threatened damages, injury or loss.

1.18.7 The Elevator Contractor shall protect floors, walls, and other surfaces from damages caused by Elevator Contractor's personnel during the course of the work. All damaged surfaces caused by Elevator Contractor's personnel shall be restored at the expense of the Elevator Contractor.

1.18.8 The Elevator Contractor shall be held responsible for compliance with the safety requirements of all city, state, and federal agencies having jurisdiction, including safety and environmental agencies.

1.18.9 The Elevator Contractor shall not include any asbestos or PCB abatement work in his proposal. Should the Elevator Contractor encounter any such products or materials during the course of the work, the Elevator Contractor shall cease work and notify the General Contractor of the findings for corrective action. On completion of corrective action by the owner or their sub-Contractor, the owner shall notify the Elevator Contractor in writing. The Elevator Contractor shall then proceed to complete their work and any predetermined schedules shall be adjusted accordingly
to time required for the owner's corrective action.

1.19 APPROVALS

1.19.1 All approvals shall be done by the architect or their approved representative.

1.20 QUALITY ASSURANCE

1.20.1 Installer Qualifications: The Elevator Contractor shall have a minimum of five-years' experience in the type of work as specified in these specifications. The Elevator Contractor must have a regular office and staff in the local area of this project. The Elevator Contractor shall have the capabilities of properly staffing this project with qualified personnel for the specified work and subsequent service work. A list of successfully completed projects may be required and shall be furnished when requested.

1.20.2 Regulatory Requirements: All work shall comply with current (at time of bid) governing local codes, conform to all laws, ordinances and regulations affecting the erection and completion of the whole or part of the work: and conform to the requirements of authorities having lawful or customary jurisdiction. These requirements shall take preference over the contract documents except where the contract documents require better materials or workmanship, also acceptable to the authorities. The Elevator Contractor shall be held responsible for any violations of codes caused by their actions or the action of their employees. Any additional expense caused thereby shall be borne by the Elevator Contractor.

1.20.3 Standards: Except as modified by local governing codes and by this section, the work shall comply with provisions pertaining to building transportation of the following, and in the event of conflict between these standards, the most stringent shall be used.

1.20.3.1 ANSI: American National Standards Institute

1.20.3.2 ASME: American Society of Mechanical Engineers

ASME Codes:

American National Standards Institute A17.1- latest edition and all supplements (A18.1- 2003).

American National Standards Institute A17.2-Practice for the Inspection of Elevators, Escalators and Moving Walks- Inspectors Manual, latest edition.

American National Standard Safety Code for Existing Elevators and Escalators, A17.3, latest edition.

American National Standard Specifications for Buildings and Facilities, Providing Accessibility and Usability for Physically Handicapped PeopleA117.1, latest edition.

Americans with Disabilities Act Accessibility Guidelines, ADAAG

3. ASTM: American Society for Testing and Materials.
4. AWS: American Welding Society.
5. CS: Commercial Standard U.S. Department of Commerce
6. CSA: Canadian Standards Association.
7. IEEE: Institute of Electronic and Electrical Engineers.
8. ISO: International Standards Organization.
9. NEII: National Elevator Industry Inc.
10. NEC: National Electric Code.
11. NEMA: National Electrical Manufacturing Association.
12. NFPA: National Fire Protection Association.
13. NBS: National Bureau of Standards.
14. OSHA: Occupational Safety and Health Administration.
15. UL: Underwriters Laboratories.
16. UFAS: Uniform Federal Accessibility Standard.
17. Model Building Codes
18. All applicable local codes

1.21 GUARANTEE

A. Elevator Contractor shall guarantee, in writing to owner, at completion of the contract, all work installed to be free from any and all known defects in workmanship and/or materials and that all furnished or installed apparatus shall develop capabilities and characteristics specified and that if during the period of one year from date of certificate of completion and acceptance of work, unless a longer period is specified, any defects in workmanship, material or performance appear, they shall remedy them without cost to owner. Should Elevator Contractor fail to remedy such defects within a reasonable length of time, the owner may have such work performed and charge all costs to the Elevator Contractor and General Contractor.

B. Title of ownership of equipment furnished to meet the requirements of this specification shall be given to owner upon full payment of the contract price or adjustments caused by other actions required by this specification.

1.22 TESTS

A. Conduct tests and adjustment of equipment as specified or necessary to verify performance requirements as required by the ASME A17.1 Safety Code for Elevators and Escalators.

B. Upon completion and full operation of all equipment, completely test same, both for the governing authorities and for compliance with the requirements of the contract documents. All equipment necessary for testing and costs involved shall be included as part of this contract. All tests shall be performed in accordance with the requirements of ASME A17 codes and other applicable codes.

C. When tests show that the new equipment is in any way defective, of poor workmanship, at variance with the requirements of the contract documents, dangerous or objectionable in operation, the Elevator Contractor shall make all necessary changes and remedy all defects at their expense. The corrective action shall be to the satisfaction of the owner. All associated costs for corrective actions and subsequent tests, until the equipment or operation is acceptable, shall be at the expense of the Elevator Contractor and General Contractor in accordance with the subcontract Agreement between these parties.

D. Upon completion of satisfactory tests, secure and furnish to the owner certificates from all departments having jurisdiction that the equipment and operation have been inspected and approved.

1.23 CLEANING AND REMOVAL

A. Cleaning: The Elevator Contractor shall at all times keep the premises, driveways and streets, clean and free from excess accumulation of waste materials or rubbish caused by the Elevator Contractor's work.

At the completion of each work day, all rubbish shall be removed from and around the premises and left broom clean, unless otherwise specified.

Any scaffolding, ladders or tools used shall be properly secured or stored to prevent unauthorized use or access by others.

B. Completion and Removal: After completion of the work and acceptance of the performance of the equipment, the work area shall be thoroughly cleaned.

All debris, unused equipment and materials associated with this contract, shall be removed. The entire work area shall be left in a clean and satisfactory condition acceptable by owner.

1.24 DISPOSAL OF EQUIPMENT

A. All equipment removal shall be done in a professional manner by competent personnel. The disposal of the removed equipment or materials, including packing and crates from new equipment, shall be the Elevator Contractor's responsibility except as otherwise directed by owner.

B. All equipment removed that may require special handling or disposal shall be handled by the Elevator Contractor's personnel or the Elevator Contractor's approved sub–Elevator Contractor.

1.25 ELEVATOR CONTRACTOR'S INSURANCE RESPONSIBILITIES in accordance with Project Manual and Subcontract Agreement terms.

1.26 INDEMNIFICATION in accordance with Project Manual and Subcontract Agreement terms.

1.27 LIABILITIES in accordance with Project Manual and Subcontract Agreement terms.

1.28 LIQUIDATED DAMAGES in accordance with Project Manual and Subcontract Agreement terms.

1.29 PRE-MODERNIZATION REPAIRS

A. These specifications are prepared to cover all equipment repairs and replacements required to provide a thorough installation for a complete modernization. The current maintenance provider may complete some of the repairs that they have in progress or determine that is their responsibility. Should any of these items have been completed and require no further work, delete the items from your proposal B. and list the deleted items as an exception and the reason for deletion.

1.30 Interim Maintenance Start of Modernization to final car has been completed

Maintenance Service: The Elevator Contractor shall furnish an all-inclusive first quality maintenance and call-back service on each elevator after it is completed and placed in operation, concurrent with warranty period. This service shall consist of examinations of the equipment at a minimum of once a month. Service shall include adjustments, lubrication, cleaning, supplies and parts to keep the equipment in proper operation, except for such adjustments, replacement of parts or repairs made necessary by abuse, misuse or any other causes beyond the control of the Elevator Contractor. All work will be done by trained employees of the Elevator Contractor during regular working hours of the trade. Emergency call-back service shall be provided at no cost to the owner and included for all hours and days during the maintenance period.

Examinations and log: During the maintenance period the Elevator Contractor shall maintain maintenance records as per ANSI A17.1 Code for each elevator. The records shall be located in the elevator machine room and be used to indicate all callbacks, repairs, replacement of parts, fire service test and adjustments performed by the mechanic each month. Each entry in the maintenance records shall be signed by the mechanic who performs the work and be kept upto-date at all times.

Section 2 Hydraulic Elevator

The materials as listed in this section intend to describe what is to be reused, refurbished or furnished as new for the passenger elevator covered by these specifications. The following is a summary of the equipment to be modernized:

2.01 RAILS

Reuse in place- The rails shall be cleaned and filed to remove all build-up on rails. Any depression or marks caused by safety applications shall be filed smooth.

Any missing splice plate bolts shall be replaced with proper sized bolts compatible to original bolts. Each spice plate shall be properly tightened.

When performing the full load test at the completion of the modernization the test should be performed with the safety application in the lower section of the building after the rails are pinned and slip clips are lubricated. Any rails requiring alignment following this action will be determined after the safety tests are completed. The contractor shall provide a ride analyzer to record the actual ride information following the safety tests.

2.02 RAIL BRACKETS

The existing rail brackets shall be reused in place. All brackets shall be checked for secure fastening. Any missing hardware shall be replaced. The rail clips contact surface shall be lubricated.

2.03 RAIL BRACKET SUPPORTS & RAIL SUPPORTS AT PIT FLOORS

The existing rail bracket support and rail backing shall be reused. All supports shall be checked for proper fastenings and any necessary refastening shall be done to provide secure fastenings. The support bolts at the bottom of the rails shall be adjusted for a maximum clearance of onehalf inch to allow for downward movement of the rails. On completion of the full load test after modernization these clearances shall be checked and readjusted if necessary.

2.03 BUFFERS-Spring

The existing spring buffers shall be reused in place. The buffers and pit channels shall be thoroughly cleaned and painted.

All buffer supports shall be checked for secure fastening.

The applicable buffer tests shall be performed in accordance with code requirements.

2.04 CAR FRAME ASSEMBLY

The car frame assembly shall be reused. All frame members shall be checked for proper fastenings. Missing fastenings shall be replaced with proper fastenings for the intended use.

When required, a balance frame shall be provided to allow for proper balancing of total assembly after all equipment and cables are attached in place. The balancing assembly shall be such that it can be mounted and contain adequate weights to keep pressure on roller guides to under fifty pounds of force per roller after balancing the assembly at midpoint of the hoistway. The elevators shall be located at the mid-point of travel and the top roller guide removed or loosened so they do not touch the rails and the car balance checked and adjusted.

2.05 PLATFORM

The existing platform shall be reused. The platform shall be checked for proper clearance for movement on the isolation. No fixed solid brackets or equipment mounting shall interfere with the ability to move on the isolation.

A new code required proper length toe guard shall be provided and securely mounted to the entrance sill. Proper support for the toe guard shall be provided to prevent excessive deflection.

2.06 GUIDES – NEW

The existing guide assemblies to be reused. The guides shall be replaced. The guides shall be proper aligned to the rail surfaces. Any missing or broken parts of the assemblies shall be replaced.

2.07 PIT LADDER - NEW

Pit ladder shall be replaced and meet applicable codes.

2.08 CABLE FASTENINGS - NEW

The existing cable fastenings shall be replaced. Cables shall be securely fastened with approved devices in compliance with code requirements. Cable tags shall be applied to the cables near the fastenings and be marked with the required data. All cables do not have proper identified information on them and some do not have cable tags.

All cables being replaced shall be provided with new code approved cable fastenings.

Anti-rotational of the cable fastening wedges shall be provided. Horizontal and vertical movement shall not be restricted.

2.09 PUMP UNIT - NEW

Pump Unit (Valve, Motor, Tank, Muffler and Pump) – EECO and Minnesota or approved vendor

Sound isolation pads shall be installed beneath the machine bedplate to reduce vibration and noise transmission to the building structure. Mount the pump unit on sound isolation pads, and provide complete sound isolation from the building in all directions. Packing to be replaced at this time.

Jack shall be properly secured to the platform and packing replaced

2.10 DOOR OPERATOR- New

A new GAL MOVFR master door operator utilizing closed loop feedback control shall be furnished to open and close the car and hoistway door panels simultaneously. The controls shall provide for limited door reversal motion on re-opening. Door motion shall be electronically controlled throughout the full travel of the opening. The operator shall have a motor of proper size, a minimum of one-half horsepower, for handling door reversal during the closing cycles in a smooth motion within two and one-half inches of travel. The operator shall be of sufficient design to provide the opening and closing times as specified in the NEII Building Transportation Standards Guidelines. The operator shall operate with a minimum of noise though the full operating cycle. The preferred operator is the manufacturer's own best model. The new door operator will have a door restrictor and door lock monitoring.

2.11 DOOR COUPLER- NEW

A new mechanical coupler to connect the car and hoist-way door panels shall be provided. The operation of the coupler shall provide driving motion of the hoist-way door panels for full open and close directions. The drive rollers or blades shall remain engaged to prevent separation of the hoist-way door panels from the driven car door panels. The coupler shall be of such design to provide the restricted opening requirements of the code.

2.12 CAR DOOR CONTACTS- NEW

The elevator car door shall be equipped with a new approved electric contact which shall prevent the operation of the elevator driving machine by the normal operating mode unless the car door is in a closed position (as defined by applicable code) except when the elevator is either stopped or stopping. Car door contacts shall be so located that they are not readily accessible from the inside of the elevator opening.

2.13 CAR DOORS, HANGER & TRACK-NEW

New Car Doors, door hanger and track shall be provided or each set of car doors. The hanger and rollers shall be designed for high-speed power operation with minimum noise. They shall have provisions for vertical and lateral adjustments. Hanger shall be designed for two-point suspension of each door panel. Hanger rollers shall be spaced as close to the ends of the door panels as possible to reduce excessive movement of the door panels. The roller shall have a resilient surface and pre-lubricated sealed bearings. Hangers shall be provided with upthrust adjustments to prevent rollers from being removed from the tracks unless the upthrusts are loosened. The track shall be a shaped finished surface to fit the roller profile and of adequate strength to properly support the door panels and periphery equipment without deflection of the track. Door guides to be replaced.

2.14 HOISTWAY DOOR HANGERS & TRACKS - NEW

The existing door hangers and tracks shall be reused for each hoistway entrance.

2.15 HOISTWAY DOOR INTERLOCKS-NEW

A new electro-mechanical interlock shall be provided for each hoist-way entrance. The interlock system shall be a tested and approved system to comply with the applicable codes. The interlocks shall prevent operation of the elevator to leave an opening unless the doors are in a closed and locked position as defined by applicable codes.

2.16 HOISTWAY DOOR UNLOCKING DEVICES - NEW

Emergency devices and keys for opening all hoist-way doors from the landing side shall be provided at all terminal floors. The existing hoistway escutcheons shall be reused on all four floors.

2.17 DOOR CLOSERS---NEW

Each door shall be provided with a reel type automatic closing device. The device shall be capable of closing the hoist-way doors from any position of the opening when they are not connected to the car door through the door coupler. The device shall not require electrical power to perform the closing operation. The existing sill closers shall be removed.

2.18 DOOR PROTECTION DEVICES-NEW

The car door shall be provided with a new protective device that detects an object in the path of the closing doors at such a distance that reversal of the doors can be provided without physical contact of the detector (with 3D option or beam extend into the hoistway 9-12 inches,

with lighting). The device shall provide this operation for a minimum of the lower two-third of the
opening height. All protection devices that do not extend to the top of the car door shall have a blank extension that matches the door protection device face material from the top of the device to the top of the door panel

The device shall include detector units that provide protection across the entire opening. The arrangement of the operation shall be to maintain the doors in a full open position if the doors are open and the detectors interrupted. Should the doors not be obstructed and in the closing motion the reversal shall be dependent on the detector assembly to allow continuous closing until minimum distance to the object of interruption is reached. An automatic adjustable timed cutout shall be provided should the detector become obstructed for an extensive period of time.

Door nudging shall be initiated when the detectors are constantly interrupted for the timed cutout period of time.

Door Lock Monitoring to be provided.

2.19 CONTROLLER-NEW - With battery lowering

Approved Vendors (GAL, Smartrise, EC Pixel and MCE) other controller manufacturers will not be accepted under this bid.

The controller shall be designed to control the starting, stopping, acceleration and deceleration of the elevator. It shall contain means for protection from excessive current to the motor. The controller shall automatically remove power, apply the brake electrically, and bring the elevator to rest in response to the operation of any of the protective safety devices. Electromechanical contactors shall be used to provide code required safety circuit protection. These contactors shall be mounted on a vibration absorbing panel to eliminate or reduce vibration to the logic portion of the controls. The contactor shall not be used to interrupt heavy currents during normal operation. Normal contactor action shall be done at zero current. All switches and contactor shall be mounted for easy access, and only approved rated contactors shall be used.

All control wiring shall be neatly formed and properly secured. The wiring shall be of the flame resistant type. The terminals shall have suitable means of identification to facilitate testing and repairs. The identification markings shall be coordinated with identical markings on the wiring diagrams.

No mechanical timers shall be used. All timers shall be of the electronic type and field adjustable. The circuits at the terminals shall be arranged so accidental grounding does not

defeat the safety circuits. Also, the terminals shall be arranged to prevent adjacent terminal shorts will eliminate a safety device circuit. All power supplies shall be properly filtered. Short circuit protection shall be provided.

2.20 SIGNAL LOGIC-MICROPROCESSOR

The signal logic shall be a microprocessor-based system. All individual car logic and hall logic shall be done by utilizing solid state boards and microprocessor logic. The system shall be of the manufacturer's latest design, but not a prototype system.

Diagnostic lights shall be clearly visible on solid state boards. The system shall contain diagnostic capability. No system utilizing removable diagnostic equipment shall be accepted without the diagnostic equipment being furnished to the owner as part of the equipment.

All inputs to the microprocessor assembly shall be through proper isolation. Outputs shall be isolated and designed to handle required current and voltage loads. Power supplies shall be properly filtered and voltage levels designed to accommodate a ten percent line voltage variation without losing regulation or overheating. All components shall be commercially available.

Circuit boards shall be moisture resistant, non-corrosive and fabricated from noncombustible material, and of adequate thickness to support the mounted components.

2.21 SIMPLEX OPERATION – **ELEVATOR TO BE EQUIPPED WITH BATTERY LOWERING**

All dispatching feature shall be selected automatically to meet the passenger traffic demand.

The system shall monitor:

Position of the elevator.
Direction of the elevator.
Door status of the elevator.
Number of car calls and destination.
Number of available elevators.
Operational status of the elevator.
Corridor calls and their location/direction.
Assigned calls.
Waiting interval of each call.
Mode of operation.
Motion of the elevator

The system shall contain but not be limited to the following features:

Elevator Parking—Specified parking floors or areas.

The system shall provide for continuously changing operation in various peak traffic situations which include predominantly one-way, intense directional traffic with opposite direction traffic, balanced two-way traffic, light traffic and occasional traffic. All traffic analysis shall be done by optimization and call allocation. All program changes shall be selected automatically.

The system operations shall change continuously by demand and not rely on a forced method of programming.

The system shall be capable of being readily programmed to suit varying building requirements.

All diagnostic equipment shall be built into the control cabinets or provided to the owner as part of the base system. No required diagnostic equipment shall be removed from the elevator machine room

Full load by pass –Elevators loaded to a pre-determined level shall not be assigned to landing calls in both directions until the elevator load has decreased below the pre-set level. All bypassed calls shall remain activated and shall be answered when the load in the elevator has been decreased to accept additional passengers the assignment may be made to this elevator.

Direction reversal – An elevator without registered car calls arriving at a floor where both up and down corridor are registered shall initially respond to the corridor call in the direction that the elevator was traveling and, if no car call is registered for future travel in the arriving direction, the elevator shall reverse the travel preference and respond to the corridor call in the opposite direction. Lantern operation shall always correspond to the next direction of elevator travel.

Programmed door control –Door open time intervals shall be programmed to match the prevailing passenger transfer condition as follows:

Corridor Call Stops
Car Call Stops
Door Re-open Interval
Lobby or Main Floor Interval
Nudging Interval

Corridor Button Automatic Cutout – In the event that a corridor button is stuck or damaged causing a constant registration and cannot be successfully canceled it shall automatically be

removed from the assignment process for an adjustable period of time after which another attempt can be made to assign and cancel it.

Traffic Intensity – The system shall have the ability to assign elevator in accordance with the traffic requirements for low traffic, normal two-way traffic, intense traffic in one way, or peak traffic. These demands shall be changed by the intensity of traffic and not be time forced.

2.22 INDEPENDENT SERVICE OPERATION

A key operated switch, or toggle switch in a locked panel, shall be provided for selecting independent service operation of an elevator. When the switch is in the “on” position, all previously registered elevator calls for that elevator shall canceled and an attendant shall be required to operate the devices for elevator operation.

The elevator shall park with its door open. The closing of the door and starting of the elevator shall be subject to constant pressure on a floor button, or start button, after registration of a call, until the doors are fully closed and motion started. If the button is released prior to full closing of the door, the door shall reopen.

After the elevator is in motion, the button may be released and the elevator shall proceed to the first available registered car call. When stopping at the selected stop all car calls shall be cancelled to allow the operator to again make a selection of a desired floor for the next operation.

An elevator operating on independent service shall not respond to registered corridor calls. The car lantern shall not illuminate when the elevator is on independent service to eliminate waiting passenger confusion.

When the switch is restored to the “off” position, the elevator shall be restored to normal operation.

2.23 HOISTWAY ACCESS-NEW

Key operated switches shall be furnished in the hoistway entrance jamb or in a separate fixture adjacent to the jamb at the top floor of each elevator for hoistway access. A key protected switch shall be provided in the car operation panel to place the elevator on access control.

Operation of hoistway access switches, after initiation by car operating switch, shall operate the elevator with the hoistway door open at the respective floor where the key switch is operated and allow access to the hoistway. Rail mounted switches shall be provided to limit the elevator travel to comply with code.

2.24 FIREFIGHTER SERVICE -NEW

The elevators shall be equipped with devices and circuits to provide firefighter's service in full compliance with applicable codes in effect as of the date of this specification.

A smoke sensing device shall be installed at all floors except the main egress floor and such other locations as required by the local codes. The smoke sensing devices and installation shall be furnished by others.

Smoke sensing devices installed and wired by others shall be equipped with a dry contact and shall be wired to the elevator machine rooms by others. The connection from this point in the machine rooms shall be connected to the elevator control system circuits by the elevator contractor.

Phase One and Phase Two operation shall be provided. Locality standard keys shall be used and shall operate both the Phase One and Phase Two key switches. These keys shall not operate any other devices and no other key shall operate these switches.

It shall be the responsibility of the elevator contractor to provide the correct service for the location of the project.

2.25 CAR TOP INSPECTION-NEW

A new inspection station shall be provided on top of the car for operation of the car at low speed by authorized personnel. The station shall contain an inspection switch, up and down buttons with a safety button and a run/stop switch. Protective guards shall be around the motion buttons to prevent accidental operation of the buttons.

When the car top inspection switch is placed in the inspection position, the car shall be placed in inspection operation. The car shall move in either direction at a low rate of speed (not to exceed one hundred and fifty feet per minute) with constant pressure applied to the direction button and the safety button providing all doors are closed and the car safety circuit is intact. Releasing the buttons shall cause the car to stop immediately. Positioning the run/stop switch in the stop position shall render all controls inactive.

A car top light switch and power outlet shall be provided. These devices may be a part of the inspection station.

2.26 WIRING-NEW

All new interconnection wiring between machine room equipment shall be furnished and installed in proper duct or conduit as required. The wiring shall be of the type as required for the equipment furnished.

All new wiring shall be furnished between the hoistway and machine room equipment and shall be installed in accordance with applicable codes. A minimum of five percent properly identified spares shall be included.

Duct and conduit that meets quality and applicable codes may be reused. New duct or conduits shall be provided where necessary.
Each hoistway shall be checked for clearance between the existing duct and car platforms or mountings on the car frame. A minimum of three quarters of an inch of clearance shall be maintained. Currently some ducts are very close to contact in their present position.

All power wiring in the machine room shall be new wiring of proper size and type for the equipment furnished. All wiring shall be copper with proper coating throughout the complete system.

The hoistway door interlock system wiring shall be new SF-2 high heat resistant wiring. All other new wiring shall have flame retarding and moisture resistant outer covering. All new wiring shall contain Underwriters Laboratories labels.

All wiring shall be in strict accordance with good wiring practices and in compliance with applicable codes.

Any elevator wiring duct in the transformer rooms that is missing some covers shall be provided with covers. Locate the missing covers or furnish and install new covers.

2.27 TRAVELING CABLES-NEW

All traveling cables shall be new and properly suspended between the car and hoistway or machine room support. All cables shall incorporate the proper size and type of conductors to connect the equipment furnished. At a minimum each traveling cable shall contain four shielded and jacketed pair and one coaxial cable. Cables shall be supported by steel supporting strands. The cable shall hang in such a manner that both sides are in parallel to each other. The

outer covering shall be fire resistant and meet Underwriters Laboratories standards. The cable shall be hung free of contact from hoistway walls or equipment and the elevator car except points of suspension. All cables shall contain a minimum of ten percent spares in each cable.

2.28 LIMIT SWITCHES-NEW

New normal and final terminal stopping switches shall be provided at each terminal. The actuating levers shall have roller with rubber or other composition tread to provide silent operation when actuated by the cam.

The terminal stopping switches shall provide and cause the elevator to stop automatically from any speed obtained under normal operation at a distance within the top and bottom over travel distances, independent of the normal operating devices. The current elevators have a terminal motion switch box and a cam. Should this be reused the cam must be checked to be sure it is straight and a new roller with a resilient surface provided on the box arm for silent operation.

Actuation of the final switches shall cause the elevator controls to remain inactive and prevent any further operation until the elevator has been manually caused to move away from the limits.

2.29 PIT SWITCHES-NEW

New stop switches shall be provided and installed in each elevator pit and at the entry point of the pit access ladder. One switch shall be accessible from the pit access door or pit ladder. Adequate switches to comply with code requirements are to be furnished. The switches shall be so connected as to cause all power to be removed from the elevator controls circuits causing the elevator to stop or remain stopped when the switch is actuated. The switches shall contain guards to prevent accidental tripping action.

2.30 CAR OPERATING PANEL---NEW –Vandal Resistant

The existing front return panel shall be removed and a new front return panel provided. The return panel shall incorporate the full car operating panel. The new panel shall have proper type of fastenings to prevent any noise when in a full locked position.

The panel shall contain floor call buttons corresponding to the number of floors served, plus the standard devices of door open, door close, alarm button, emergency stop button (unless it is not allowed by governing authority), independent service key switch, fan switch and a light switch at a minimum.

The standard required cluster of devices, to comply with handicap accessibility, shall be located at a centerline height of thirty-five inches from finished cab floor. All standard required devices

and floor call buttons shall also be located at a height to meet handicap requirements and have handicap indications on the buttons or adjacent to them.

Appropriate firefighter's service key switch, light jewel, fire and call cancel button, shall be provided in car operating panel. (Under a locked panel)

An emergency light unit shall be either included in the car operating panel or located elsewhere in the car enclosure to provide the required illumination when a loss of normal power to the elevator is lost. A test button shall be provided in the car operating panel to test the emergency light. Should the light lens be in the car panel it shall be a flush lens.

A digital position indicator shall be provided in the car operating panel. The position indicator shall provide a clear display showing the location of the elevator in the hoistway. The illuminated indicator shall be a minimum of three inches in height.

Appropriate key switches for operating functions of the system provided shall be provided and clearly identified for their function.

The finish of the panel shall match the cab interior entrance column finish.

The finish of the panel shall be a number four stainless steel finish.

2.31 HALL LANTERNS-NEW

The lantern light shall be of adequate intensity to clearly indicate the direction of travel. The gong shall be replaced with a synthetic type sound that is adjustable to obtain the desired level of sound in the corridor when the lantern is illuminated.

The lantern shall illuminate and the gong sound as the elevator responds to a landing call. The lantern shall remain illuminated until the doors start to close. The lantern shall not illuminate and the gong shall not sound when the elevator is operating under a condition where corridor calls are not accepted for a response.

2.32 POSITION INDICATORS-NEW

An electronic readout type position indicator shall be provided to give a visual indication of the car position in the main car operating panel.

As the elevator travels through the hoistway, the numeral corresponding to the floor at which the elevator is stopped or passing shall be displayed on the position indicator. The indicator shall be formed by dot matrix, bar segment, or light emitting diodes (LED) type of display. Incandescent bulbs shall not be used. Change from one number to another shall be instantaneous and complete.

The readout size indicators shall be three inches in height.

Approval of the type of indicator is required.

2.33 CORRIDOR CALL BUTTONS-NEW VANDAL RESISTANT

Single riser of corridor call buttons for the simplex shall be provided at each landing. The button assemblies shall consist of a single illuminated button for each terminal and two illuminated buttons at each intermediate floor. The illumination shall be of the L.E.D. type. All button faceplates are to be surface or flush mounted to the wall surfaces. The finish of the cover plates shall be a Stainless Steel #4 finish.

The button shall be illuminated when it is pressed for the desired direction of travel and the action is registered in the control system. Illumination shall indicate acceptance of the call into the logic system of the controls. The buttons shall be identical to the floor call buttons in the car operating panels.
A firefighter's service switch assembly shall be provided at the fire recall floor(s) as required by applicable codes. Pictograph and instruction for fire service shall be engraved in the required cover plates.

2.34 ALARM BELL OR SIREN-NEW

The alarm bell or siren shall be located on the exterior of the elevator cab enclosure. The bell or siren shall be of adequate sound level (minimum 80dba at a distance of three meters) so it can alert someone of the emergency. The device shall be activated by an alarm button in the car enclosure or by action of the stop switch. The device shall be connected to the battery source of the emergency lighting or be provided with a separate battery source that can be tested. The battery shall be of a rechargeable type with long life expectancy.

2.35 EMERGENCY LIGHTING-NEW

The emergency lighting system shall be a rechargeable battery-operated system that is connected to the normal and emergency lighting supply. The system shall meet the specified or code requirements for time duration and light intensity. The unit shall contain a test button to verify operation to occur when power fails. The unit shall contain provision for a compatible

alarm bell or siren that will operate from the battery source and the device shall be included. A test button shall also be located in the car operating panel.

2.36 ADA PROVISIONS---Passenger elevators

The elevator equipment being provided shall be designed to conform to the applicable regulations in effect as of the date of this specification. These features shall include but not be limited to:

1. Raised numbers and symbols on car operating panels.

2. Raised numerals, Braille, and symbols on hoistway entrance jambs. Reuse existing. Passenger elevators only.

3. Car operating panel devices located at proper height.

4. Audible floor passing signal.

5. Correct lantern operation.

6. Hand rail in the passenger elevator cabs at proper height.

2.37 TELEPHONE- NEW

A hands-free telephone with video shall be installed in the new car operating panel by the elevator contractor. The elevator contractor shall be responsible to provide wires to the telephone from a termination in the machine room.

A certificate frame shall be provided for the local authority certificate. This frame may be part of the telephone box cover. In instances where the certificate can be kept on file and not in the elevator, engraving on the cover plate may be provided stating that the certificate is on file.

2.39 ENTRANCES

The hoistway doors and frames shall be reused. The hoistway door unlocking holes in the door panels are to be reused if compatible for the new door operating equipment. If not compatible, or cannot be adapted to the new equipment requirements, new holes are to be provided in the appropriate location and snap-in covers provided for the existing holes.

Sight guards on the leading edge of the door panels are to be replaced. They are to be checked for secure fastening. Any missing or broken guards are to be replaced.

Floor numbers on the hoistway side of the hoistway doors shall be provided.

2.40 CAB INTERIOR (Snap Cab or approved cab vendors)

Interior Wall Finish: Removable panels, faced and edged, with binder edges with color core plastic laminate. Formica Layered Sand 9511
https://www.formica.com/en-us/products/lamhome/09511

or, if unavailable in needed quantities etc.

Wilsonart
Casual Linen 4944-38 https://www.wilsonart.com/laminate/pricing-tiers/tier1/casual-linen-4944

1. Plastic Laminate, Per above. Front returns to be replaced.

2. Ventilation: Two-speed exhaust blower mounted to car canopy on isolated rubber grommets. Exhaust blower shall meet requirements of Item 2.03; H. Ventilation shall shut off after an adjustable period (60 – 180 seconds) of no elevator demand.

3. Lighting: Provide recessed LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements. Lighting shall shut off after an adjustable period (60 – 180 seconds) of no elevator demand. Provide emergency lighting integral with a portion of normal car lighting system. Include required transformer.

4. Handrails: Minimum 1-1/4" diameter stainless steel tubular grab bar across rear and side walls.

5. Cab Pads shall meet the flame spread requirements for elevator cabs. Pad hanging studs shall be furnished and installed in the cab. The pad hanging supports shall be above the wall panels to allow for panel replacement without removing of the supports. The panel supports shall be on a two-and-a-half-inch centerline below the light fixture and a support is to be provided approximately every eight inches. The pads are to be furnished for the elevator designated as the passenger/service elevator.

6. Flooring basis of design LVP-2, Vinyl Plank, Patcraft, 1436 V Heartwood, 775 XYLEM, 20 milwear layer to be installed.

3.0 EXECUTION

3.01 HOISTWAY INSPECTION

Elevator Contractor must verify conditions of hoistways, pits, and machine rooms; and inspect the support structure and services, to determine the conditions under which elevator work is to be installed. The Elevator Contractor shall notify owner or his agent in writing of unsatisfactory dimensions or conditions. The Elevator Contractor shall not proceed with elevator installations until unsatisfactory dimensions and conditions have been corrected, or approved, in a manner acceptable to Elevator Contractor.

3.02 WELDED CONSTRUCTION

Welded connections may be provided for installation of elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.

3.03 COORDINATION

Coordinate elevator work with work of other trades, for proper time and sequence to avoid installation delays. Use benchmarks, lines and levels designated by owner, or their agent, to ensure dimensional coordination of the work.

3.04 SOUND ISOLATION

All new equipment furnished shall be mounted on vibration absorption mounts, designed to effectively prevent transmission of vibrations to structure, and thereby eliminate sources of structure borne noise from the elevator system.

3.05 ACCEPTANCE TESTING

The Elevator Contractor shall perform the final adjustments and tests during regular working hours.

A. Upon nominal completion of each elevator installation, and prior to permitting use of elevator (either temporary or permanent), perform acceptance tests as required and recommended by applicable codes and governing authorities.

B. Advise the owner, or their representative, and inspection department of governing agencies, in advance of dates and times tests are to be performed on elevators.

3.06 PROTECTION

Installer shall advise owner, or their agent, of recommended protection procedures to prevent damage and deterioration of completed elevator work.

3.07 INSPECTION

The owner, or their representative, shall be permitted to make periodic and final inspections of the work for compliance with contract documents. The Elevator Contractor shall provide manpower necessary to assist during such inspections. The owner, or their representative, shall prepare and submit to the Elevator Contractor the inspection
reports describing incomplete or corrective work required to satisfy contract requirements.

3.08 SUBMITTALS ---MODERNIZATION

A. The Elevator Contractor shall prepare all required drawings as listed, or as required, for the elevator equipment. Drawings requiring approvals shall be properly approved by the owner, or their representative, and other authority prior to fabrication and installation of the equipment.

B. Shop Drawings

1.Manufacturer's brochure and information on the control equipment.

1. Door Operating Equipment manufacturer's name and literature.
2. New machine drawings and structure stamped drawings

3. Operating Fixture detail drawings for car and corridor.

4. Car Identification Numbers for Lobby.

5. Any special requirement information for the intended equipment.

6. Project schedule.

C. Calculations –

1. Heat emissions in machine room(s).

2. Electrical loads include starting, accelerating, and running currents, including auxiliary loads.

3. Power supply confirmation request form.

D. Elevator Contractor shall submit four sets of drawings, catalogs and catalog data of all new equipment to be furnished requiring approval.

E. As soon as approval has been given, make any necessary revisions and submit four final sets of approved drawings, information and schedules. Also supply to the field required information for performance of the work.

F. All submittals shall be on dates sufficiently in advance of job progress requirements to afford ample time for checking. No claim for extension of contract time shall be granted the Elevator Contractor by reason of their failure to comply with this requirement. All submittals shall be complete and shall contain all required and detailed information.

G. Elevator Contractor shall check all submittals for conformity with contract specifications and correct any errors, omissions, or deviations before transmittal to owner. Specifications, catalogs, etc., submitted for approvals shall be properly labeled indicating specific application for which material or equipment is to be used. Catalogs, pamphlets, or other documents submitted shall describe the items for which approval is being requested. The information shall be specific and clearly identified.

H. Elevator Contractor shall be responsible for correct quantities, dimensions, design of adequate connections, and details for satisfactory construction of all work and furnishing of materials for the work required by the intent of the contract documents, even if not indicated on submittals that that have been approved by owner or authorized representative.

I. Owner, or authorized representative, shall check drawings for design only and approval of drawings, schedules, and catalogs shall not be construed as a complete check and shall not relieve Elevator Contractor of their responsibilities as stated above.

J. If submittals differ from requirements of contract documents, Elevator Contractor shall make specific mention of such differences in their letter of transmittal with a request for substitution, together with their reason for same. If acceptable, suitable action shall be taken for proper adjustments reflecting the change. It is understood and agreed that specific written approval of substitute materials and/or methods is required before Elevator Contractor can proceed with a substitution.

K. No material shall be delivered until Elevator Contractor has obtained written approval of shop drawings and other data enumerated in this section. Should materials or equipment be delivered before required approvals, Elevator Contractor shall be liable for removal and replacement at no charge to owner, if material or equipment does not meet intent of approved documents.

L. By approving and submitting shop drawings and samples, the Elevator Contractor thereby represents that they have determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or shall do so, and that they have checked and coordinated the shop drawings and samples with the requirements of the work as detailed in the contract documents.

M. Prior to the final acceptance of the total project work, submit three copies of the following bound manuals to the owner or authorized representative for review:

1. Operating Instructions: Printed or typewritten literature describing the function and operation of all controls.

2. Maintenance Instructions: Printed or typewritten schedules of all required maintenance procedures and special lubricants.

3. Wiring Diagrams: Full size, ladder type, complete “as built” wiring and single line diagrams showing the electrical connections, functions and sequence of operation of apparatus connected with the elevators, both in the machine room and in the hoistway, shall be furnished for each simplex elevator or for each group of elevators at the time of final inspection and acceptance. Coded information is not acceptable.

N. Deliver to the owner five keys for each type of lock used to control the equipment or other operating function for the equipment furnished, including locked cabinets. Clearly identify the function of each type of key with a permanent tag.

3.09 APPROVALS

A. All approvals for the elevator work covered by these specifications shall be done by the owner or their approved representative, who may be an employee, or contracted architect or consultant. All approvals shall be done in a timely manner and not unreasonably withheld without providing to the Elevator Contractor a specific reason for delays or approval.

B. All approvals for work by others shall be approved by the owner, or owner's representative, or the person designated to handle the subject portion of the project.

C. Any delays in approval by owner, or their representative, that affect the submitted schedule shall extend the schedule equivalent to the length of the approval delay.

3.10 PERFORMANCE

A. The individual performance of like elevators shall be the same. Each elevator shall be adjusted for optimum performance and shall be within the following maximum limits:

B. Door Open Speed—Minimum two feet per second average.

C. Door Close Speed—Approximately one foot per second and in compliance with the forces allowed in the applicable codes.

D. Brake to brake time for contiguous floors of a distance not to exceed twelve feet of travel shall be less than 4.8 seconds for elevators of a speed greater than 300 feet per minute.

E. Overall performance time from start of door close to a distance of a passenger being able to exit the elevator, for elevators described in the foregoing paragraph, shall be

less than 9 (nine) seconds for forty-eight-inch center parting doors and 10.5 seconds for forty-eight-inch two speed doors.

F. Floor stopping accuracy shall be within ¼ inch of exact level and leveling accuracy shall be maintained within 3/8 inch though loading and unloading conditions.

G. Full speed shall be maintained within three percent of specified under all load conditions up to rated capacity.

H. Noise level in the car enclosure shall be less than 55 decibel average during running operations and a maximum increase of three decibel average during door operation at a distance of one meter from floor and one meter from door panels.

I. Ride quality shall be such that there are no sudden horizontal accelerations. The maximum allowable peak to peak acceleration shall be thirty mg. within the .25 to 10 hertz band width. These measurements shall be taken with an accelerometer sensing unit placed in the center of the elevator floor without any sound or vibration absorption material between the unit and the platform. All readings in excess of the allowable shall cause readjustment or realignment to correct the source or cause of the excessive readings. Refer to Section 2.01 for any rail alignment that may be required to accomplish the desired ride quality.

J. These performance requirements and the NEII Performance Standards shall be the standard to which the performance will be measured. The more stringent of the performance requirements shall be required to be met.

K. Should the Elevator Contractor determine that the equipment they are proposing to furnish cannot comply with these performance requirements, the equipment shall not be installed without submission of a request for a variance and such variance granted.

3.11 WARRANTY

A. Maintenance Service: The Elevator Contractor shall furnish an all-inclusive first quality maintenance and call-back service on each elevator after it is completed and placed in operation for a period of twelve (12) months, concurrent with warranty period. This service shall consist of examinations of the equipment at a minimum of once a month. Service shall include adjustments, lubrication, cleaning, supplies and parts to keep the equipment in proper operation, except for such adjustments, replacement of parts or

repairs made necessary by abuse, misuse or any other causes beyond the control of the Elevator Contractor. All work will be done by trained employees of the Elevator Contractor during regular working hours of the trade. Emergency call-back service shall be provided at no cost to the owner and included for all hours and days during the maintenance period.

Thirty days before expiration of the twelve (12) month maintenance service, the Elevator Contractor shall schedule an inspection of the elevator equipment with the Owner or his representative. This inspection is to assure that the elevator equipment is in safe first-quality, operating condition and the equipment is operating in line with its original design. An authorized representative of the Elevator Contractor shall accompany the Owner or his representative.

Examinations and log: During the warranty maintenance period the Elevator Contractor shall maintain maintenance records as per ANSI A17.1 Code for each elevator. The records shall be located in the elevator machine room and be used to indicate all callbacks, repairs, replacement of parts, fire service test and adjustments performed by the mechanic each month. Each entry in the maintenance records shall be signed by the mechanic who performs the work and be kept up-to-date at all times.

3.12 STAND-BY TIME

The Elevator Contractor shall include one working day per elevator of standby time, or car running time, to assist other Elevator Contractors performing work in each passenger elevator hoistway.

3.13 OVERTIME

Include the required overtime to allow for shut down of the adjacent elevator(s) for the installation of hoistway screening. This shall be done during building closed hours. Include any required overtime to remove existing machine room equipment and hoist the new machine room equipment. All elevator hoistways requiring screening shall be done at one time.

3.14 PROPRIETARY TOOLS OR DIAGNOSTIC EQUIPMENT

Any diagnostic tools or equipment required for diagnostics, troubleshooting, or setting parameters that are not commercially available from other sources and required to provide proper maintenance must be provided to the owner as part of the purchased equipment. No tools or equipment shall contain software or components that will be

time stamped to expire. Any subsequent calibration of the diagnostic tools shall be provided by the original supplier as necessary at a nominal charge.

The Elevator Contractor shall furnish a duplicate set of programmed processor chips for the individual and group control system of both the high rise and low-rise groups to the owner after final completion and acceptance of final operation of the elevators. These are to be kept by the building owner and not allowed to be removed from the premises by anyone.

3.15 MAINTENANCE

A. All maintenance work shall be performed during regular working hours on regular working days, or as required by the maintenance contract by maintenance personnel. Modernization personnel shall only assist in case of an entrapment or emergency.

3.16 PAINTING

A. All unpainted elevator equipment in the hoistway and machine room shall be properly painted with a minimum of one finish coat of paint with a hard-semi-gloss finish.

B. Factory painted equipment in the machine room should have all scratches and mars touched up with the same color and type of paint used by the factory.

C. After final acceptance of the modernization work the machines shall be thoroughly cleaned and painted by the Elevator Contractor with a hard-semi-gloss finish coat.

D. After final acceptance of all modernization work and painting of the machines the machine room floor shall be painted Industrial Gray by the Elevator Contractor.

4.0 WORK NOT INCLUDED

4.01 STRUCTURAL

A. Any modification to existing structural support required for new equipment. The necessary blocking beams for the rope gripper to be supported by the existing machine beams shall be by the Elevator Contractor. Elevator Contractor shall provide loading data when it exceeds five percent of the existing loads for calculations of loading by others.

B. Any modification to existing shaft way to provide a legal shaft way in compliance with latest applicable code requirements.

C. Changes required for hoistway ventilation. Outside vents are to be provided to provide three and one-half percent of the hoistway size, and no less than three square feet, whichever is greater.

D. Any modification to machine room to provide adequate and a code compliance machine room. This includes a self-closing self-locking access door to all elevator equipment rooms.

K. Provide proper closing or screening of hoistway

4.02 MACHINE ROOM

A. Changes required to ventilation or temperature control system to maintain machine room temperature range of ten degree to thirty-five degree Centigrade, (Fifty to ninety-five degrees Fahrenheit). If hoistways are ventilated through the machine room then adequate ventilation to the outside must be provided.
Currently this is maintained at approximately 80 degrees in machine room.

B. Machine room lighting C. GFCI Outlet to be installed

4.03 HOISTWAY

A. Patching, grouting, plastering, masonry and painting that may be required to finish walls in hoistways.

B. When sump pumps are provided, they must not discharge into waste drains. Cover sump area with metal cover or guard.

C. Painting of hoistway doors and entrance frames that building management may want to refinish.

F. Patch any opening in the hoistway walls.

G. Provide bevel guards on all setback areas.

H. Provide proper pit ladders. Current ladders need to be extended to comply with requirements.

I. Pit lighting

J. Separate pit circuits to be provided for lighting and GFCI

4.04 ELECTRICAL

A. Providing power of proper characteristics for equipment as required by National Electric Code for ASME A17.1 Code for elevators.

B. Provide smoke detector in each elevator lobby, top of hoistway and machine room for fire fighter's operation. Main floor shall be individually zoned. Provide dry contacts to elevator hoistway from each detector location to activate fire fighter's operation. Such units shall be installed and wired to marked terminals in hoistway at each landing or in the machine rooms. Connection to the elevator equipment shall be by Elevator Contractor.

C. Provide machine room lighting and GFCI electrical outlets. Provide proper guards over lighting fixtures.

D. Provide single phase 20-amp power to each elevator controller for cab lighting and exhaust blower.

E. Provide telephone connection for each individual elevator in the machine room. Any existing phone lines can be reused.

F. Provide proper pit light switch at door or ladder, additional lights, and GFCI protected power outlet for each pit area.

I. Provide proper electrical outlets for equipment in the machine room and remove all loose extension cords.

4.05 MISCELLANEOUS:

A. The Elevator Contractor and General Contractor are responsible for all temporary storage requirements. The owner will not be responsible for providing or coordinating temporary storage needs.

B. Painting of interior of machine room walls and hoistway, if required, shall be done by others. Elevator equipment is to be painted, as detailed in the elevator section, by Elevator Contractor.

C. No equipment, including conduit and wiring, other than that required for the elevator equipment shall be installed in the elevator hoistways.

D. Providing electrical power for lights, tools, and hoists during the modernization phase and for testing and adjustment of the completed system.

END OF SPECIFICATIONS

1) Surfaces by Pacific; www.surfaceofpacific.com.
b. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with NSI (DSDM).
c. Finish on Exposed Surfaces: Polished.
3. Other Components Thickness: 3/4 inch, minimum.
4. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.

2.02 MATERIALS
A. Wood-Based Components:
1. Wood fabricated from old growth timber is not permitted.
B. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.
C. Particleboard for Supporting Substrate: ANSI A208.1 Grade 2-M-2, 45 pcf minimum density; minimum 3/4 inch thick; join lengths using metal splines.
D. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
E. Joint Sealant: Mildew-resistant silicone sealant, color as selected by Archtect .

2.03 FABRICATION
A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
1. Join lengths of tops using best method recommended by manufacturer.
2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
4. Provide radiused outside corners.
B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
2. Height: 4 inches standard. Provide 6" heiht at accessible units and public use common areas unless otherwise indicated.
C. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

PART 3 EXECUTION

3.01 EXAMINATION
A. Do not begin installation until substrates have been properly prepared.
B. Field Measurements: Verify countertop size and shape prior to fabrication by field measurements taken after base units are installed.
C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
D. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION
A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION
A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.
C. Attach wood countertops using screws with minimum penetration into substrate board of 5/8 inch.
D. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES
A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING
A. Clean countertops surfaces thoroughly.

3.06 PROTECTION
A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 14 9100 - FACILITY CHUTES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Gravity chutes for waste materials (trash and refuse), soiled linens, and recyclables.

B. Chute maintenance.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood curb at roof vent.

B. Section 07 2126 - Blown Insulation: Insulation between chute and enclosure.

C. Section 07 6200 - Sheet Metal Flashing and Trim: Counterflashing at chute roof vent.

D. Section 22 1005 - Plumbing Piping:

E. Section 26 0583 - Wiring Connections:

F. Section 28 4600 - Fire Detection and Alarm: Connection of interlock systems and sensors to fire alarm system.

1.03 REFERENCE STANDARDS

A. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

B. NFPA 82 - Standard on Incinerators and Waste and Linen Handling Systems and Equipment; 2019.

C. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for additional requirements.

B. Product Data: Manufacturer's printed data sheets on each component, indicating which options are provided.

C. Shop Drawings: Provide detailed layout of chute and components, indicating interface with structure, enclosing walls, and utilities; include the following:

1. Openings in floors and required clearances.
2. Location and size of each field connection to structure.
3. Pipe sizes and locations.
4. Electrical wiring sizes, conduits, and location of connections.
5. Clearly indicate components required but not furnished by chute installer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1. With similar installations having satisfactory service for at least one year.
2. With a full time service organization maintained or trained by manufacturer, and providing service within 12 hours of receiving notice that service is required.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least two years of documented experience.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Facility Chutes:

1. U. S. Chutes Inc: www.uschutes.com.
2. Wilkinson Hi-Rise: www.whrise.com.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FACILITY CHUTES

2.03 COMPONENTS

A. Chute Intake Doors: Factory-assembled, UL (DIR) listed and labeled door and frame, with self- or automatic-closing and positive latching; frame designed for chase construction, and flush-mounted.

1. Material: Stainless steel, brushed or satin finish.
2. Fire Rating: In compliance with local building code requirements.

B. Chute Discharge Doors: Factory-assembled, UL (DIR) listed and labeled door and frame, with self- or automatic-closing and positive latching, upon activation of smoke detector or fusible link; style as required for facility chute configuration indicated.

1. Material: Aluminum-coated steel.
2. Fire Rating: In compliance with local building code requirements.

C. Chute Intake and Access Door Locks: Mortise or rim cylinder locks keyed alike; key removable only when door is locked.

D. Fire Suppression Sprinklers: Comply with requirements of NFPA 82 and NFPA 13; provide 1/2 inch NPS sprinkler heads mounted inside chute intake throats at following locations:

1. In buildings of more than two stories, at every other floor.

E. Spray Cleaning Equipment:

1. Flushing Spray Unit: Solenoid controlled 3/4 inch NPS spray head mounted above top intake door. Refer to Section 22 1005 for water piping connections and Section 26 0583 for wiring connections.

F. Electrical Controls: 110 VAC. Refer to Section 26 0583 for wiring connections.

PART 3 EXECUTION

3.01 INTERFACE WITH OTHER WORK

A. Complete facility chutes and equipment installation and testing before completion of the enclosing construction.

B. Coordinate sprinkler and spray cleaning devices with size, location and installation of service utilities.

C. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

3.02 INSTALLATION

A. Maintain fire-resistive capacity of enclosing walls.
B. Install roof vent flange to roof deck prior to installation of roofing.
C. Install counterflashing after roofing installation.
D. Adjust doors and other operating components for smooth operation.

END OF SECTION

SECTION 21 0050 - FIRE SUPPRESSION EXECUTION

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the following:
   1. Definitions.
   2. Coordination.
   3. Piping materials and installation instructions common to most piping systems.
   4. Mechanical sleeve seals.
   5. Sleeves.
   6. Escutcheons.
   7. Grout.
   8. Fire-suppression demolition.
   9. Concrete bases.
   10. Supports and anchorages.

1.02 RELATED DOCUMENTS

A. Drawings, General Provisions of the Contract, including General Conditions, Supplementary General Conditions, other Division 00 & 01 Specification Sections, shall apply to this division.

B. These requirements apply to all Division 21 work.

1.03 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.04 COORDINATION

A. Coordination: Coordinate construction operations to ensure efficient and orderly installation of the Work.
   1. Coordinate construction operations, that depend on each other for proper installation, connection, and operation.
   2. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   3. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
   4. Make adequate provisions to accommodate items scheduled for later installation.
   5. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Construction Schedule.
   2. Preparation of the Schedule of Values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Preinstallation conferences.
   7. Project closeout activities.
   8. Startup and adjustment of systems.
   9. Project closeout activities.

1.05 PROJECT MEETINGS

A. General: Attend meetings and conferences at Project site, unless otherwise indicated.
   1. Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Engineer of scheduled meeting dates and times.
   2. Agenda: Request the meeting agenda if not furnished prior to meeting.
   3. Minutes: Record significant discussions and agreements achieved. Request the meeting minutes if not furnished. Note all discrepancies and notify Engineer of all changes to the Work or to the Contract Documents.

B. Preconstruction Conference: Attend the preconstruction conference before starting construction, no later than 15 days after execution of the Agreement to review responsibilities and personnel assignments.
   1. Attendees: Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss items of significance that could affect progress, including the following as applicable:
    a. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing and long-lead items.
    d. Designation of key personnel and their duties.
    e. Procedures for processing field decisions and Change Orders.
    f. Procedures for requests for interpretations (RFIs).
    g. Procedures for testing and inspecting.
    h. Procedures for processing Applications for Payment.
    i. Distribution of the Contract Documents.
    j. Submittal procedures.
    k. LEED requirements.
    l. Preparation of Record Documents.
    m. Use of the premises.
    n. Work restrictions.
    o. Owner's occupancy requirements.
    p. Responsibility for temporary facilities and controls.
    q. Construction waste management and recycling.
    r. Parking availability.
    s. Office, work, and storage areas.
    t. Equipment deliveries and priorities.
    u. First aid.
    v. Security.
    w. Progress cleaning.
    x. Working hours.

C. Preinstallation Conferences: Attend a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following as applicable:
    a. The Contract Documents.
    b. Options.
    c. Related requests for interpretations (RFIs).
    d. Related Change Orders.
    e. Purchases, deliveries, submittals.
    f. Review of mockups.
    g. Possible conflicts.
    h. Compatibility problems.
    i. Time schedules.
    j. Weather limitations.
    k. Manufacturer's written recommendations.
    l. Warranty requirements.
    m. Compatibility of materials.
    n. Acceptability of substrates.
    o. Space and access limitations.
    p. Regulations of authorities having jurisdiction.
    q. Testing and inspecting requirements.
    r. Installation procedures.
    s. Coordination with other work.
    t. Required performance results.
    u. Protection of adjacent work.
    v. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present, to parties who should have been present, and to the Engineer.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

1.06 SUBMITTALS

A. Alternate Products: Alternate manufacturers, equipment and/or products must be specified or approved prior to bid in writing via addendum to be accepted. All costs associated with deviations from the basis of design shall be borne by the contractor. Deviations shall include alternate manufacturer and/or alternate product and shall include all significant dimensional, performance, electrical, or installation differences from the basis of design products. Costs for reimbursement shall include the costs of other trades affected, and shall include all engineering costs to evaluate such deviations.

B. Substitutions: Unspecified manufacturers shall be considered substitutions and shall be submitted for consideration under the specified substitution procedures. Substitutions shall be submitted to the engineer for evaluation. If approved by the engineer, substitution shall be offered to the owner for consideration. All costs associated with substitutions shall be borne by the contractor. Costs for reimbursement shall include the costs of other trades affected, and shall include all engineering costs to evaluate such deviations.

C. Coordination Drawings: Prepare Coordination Drawings (coordinated shop drawings) to maximize utilization of space for efficient installation of different components and for installation of products and materials fabricated by separate entities. Submit to Engineer for review before starting work.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:

a. Indicate functional and spatial relationships of components of the work with all other systems and trades.

b. Indicate required installation sequences.

c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide sketches of proposed alternate construction to Engineer for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

D. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project. Submit to Engineer before starting work.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

E. Make all necessary field measurements and investigations to assure that the equipment and assemblies will meet contract requirements. If equipment is submitted which differs in arrangement from that shown, provide drawings that show the rearrangement of all associated systems. Approval will be given only if all features of the equipment and associated systems, including accessibility, are equivalent to that required by the contract.

F. Prior to submitting shop drawings for review, contractor shall certify in writing that manufacturers of all major items of equipment have each reviewed drawings and specifications, and have jointly coordinated and properly integrated their equipment and controls to provide a complete and efficient installation.

G. Welding certificates.

1.07 Warranties

A. All work shall include a parts and labor warranty on materials and workmanship for a period of 1 year.

B. Refer to Division 01 for additional warranty requirements.

PART 2 PRODUCTS

2.01 SLEEVES

A. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

B. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

C. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include underdeck clamp, clamping ring with set screws, nuts, and bolts for membrane flashing.

D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."

2.02 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.

1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.

2. Design Mix: 5000-psi, 28-day compressive strength.

3. Packaging: Premixed and factory packaged.

2.03 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

1. Sealing Elements: EPDM-rubber or NBR interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

2. Pressure Plates: Carbon steel.

3. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements.

2.04 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.

C. One-Piece, Cast-Brass Type: With set screw, and polished chrome-plated finish.

D. Split-Casting, Cast-Brass Type: With concealed hinge, set screw and polished chrome-plated finish.

2.05 PIPE, TUBE, AND FITTINGS

A. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.06 JOINING MATERIALS

A. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
B. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
C. Welding Filler Metals: Comply with AWS D10.12.
D. Solvent Cements for Joining CPVC Plastic Piping: ASTM F 493.

PART 3 EXECUTION

3.01 **COMMON REQUIREMENTS**

A. Install according to manufacturer requirements and other Division specification sections.
B. Drawing plans, schematics, and diagrams indicate general location and arrangement of systems. Indicated locations and arrangements were used to size and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas. Where located within walls and other concealed areas subject to damage, provide suitable protection.
D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
F. Materials exposed within plenums shall be noncombustible or have a flame spread index of 25 or less and a smoke-developed index of 50 or less.
G. Install piping and equipment with clearances to permit servicing.
H. Install piping at indicated slopes free of sags and bends and with fittings for branch connections and changes in direction.
I. Select system components with pressure rating equal to or greater than system operating pressure.
J. Contact manufacturer's representative to visit site and observe installation in order to confirm installation requirements and warranty coverage. Document observation in writing and include in O&M manuals.
K. Provide service and maintenance for not less than one year from the Date of Substantial Completion or for the warranty period specified in Division 01, whichever is longer. Refer to Division 01 for additional service and requirements.

3.02 PENETRATIONS

A. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls. Sleeve ends shall be flush with both wall surfaces unless otherwise noted. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Concrete and masonry penetrations: seal space outside of sleeves with grout. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
B. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
C. Roof-Penetrations: Seal penetration of roof with flexible boot-type flashing units applied in coordination with roofing work.
D. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetration using sleeve and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
E. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
F. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at. Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07. "Comply with requirements in Division 07."
G. Apply firestopping to penetrations of fire and/or smoke rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07.
H. Penetrations of membranes of rated walls shall be protected by UL listed products. Coordinate exact installation conditions with selected fire sealants supplier. For penetrations which do not have a standard UL installation detail, arrange for engineering determination from damper manufacturer and/or sealant supplier and provide modifications required to match detail.
I. Install escutcheons for penetrations of walls, ceilings, and floors.

3.03 PIPING JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
C. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
D. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
E. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

F. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
G. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
H. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Comply with ASTM F 402, for safe-handling practice of cleaners, primers, and solvent cements. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.

3.04 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:
   1. Install unions, adjacent to each valve and at final connection to each piece of equipment.
   2. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
   3. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.05 **INSTALLATION - COMMON REQUIREMENTS**

A. Install equipment, valves, and specialties according to manufacturer installation instructions and recommendations.
B. Refer to other Sections of these Specifications for additional requirements.
C. Install to allow maximum possible headroom unless specific mounting heights are indicated.
D. Install work level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
E. Install work to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
F. Install to allow right of way for piping installed at required slope.
G. Contact equipment manufacturer's representative to visit site and observe installation in order to confirm installation requirements and warranty coverage. Document observation in writing and include in O&M manuals.
H. Provide service and maintenance for not less than one year from the Date of Substantial Completion or for the warranty period specified in Division 01, whichever is longer. Refer to Division 01 for additional service and requirements.

3.06 SUPPORTS AND ANCHORAGES

A. Provide supports to match construction type and adjacent assembly rating.
B. For combustible construction, provide wood supports and anchorages. Cut, fit, and place nailers, blocking, and anchorages to support, and anchor materials and equipment. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
C. For non-combustible building construction provide metal supports and anchorages. Refer to Division 05 Section "Metal Fabrications" for structural steel. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment. Field Welding shall comply with AWS D1.1.
D. Attach to substrates to support applied loads.

3.07 GROUTING

A. Clean surfaces that will come into contact with grout. Provide forms for placement of grout.
B. Mix and install grout for equipment base bearing surfaces, and anchors.
C. Place grout around anchors and completely filling equipment base and provide smooth bearing surface for equipment. Avoid air entrapment during placement of grout.
D. Allow grout to cure before loading or applying forces.

3.08 SLEEVE-SEAL INSTALLATION

A. Install to seal below-grade exterior wall penetrations.
B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

END OF SECTION 210500

SECTION 21 0500 - COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 GENERAL

1.01 Section Includes

A. Above ground piping.
B. Buried piping.
C. Escutcheons.
D. Mechanical couplings.
E. Pipe hangers and supports.
F. Pipe sleeves.

1.02 **COORDINATION**

A. Coordinate bidding with other trades. For work not included by other trades or utility, include costs in bid for all work required for operational, UL listed fire protection systems (tap, underground piping, site work, PIV, backflow assembly, FDC, draft curtains, etc.). Provide itemized costs for adjacent and subcontracted work.
B. Coordinate design with building use and structure combustibility, hazard/flow requirements, pipe routing, offsets and listed head locations.
C. Coordinate fire protection design with local codes, requirements and AHJ interpretation before applying for permit.
D. Coordinate construction operations to ensure efficient and orderly installation of the Work.

1.03 Submittals

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturers catalogue information. Indicate flow data and ratings.
C. Shop Drawings: Indicate pipe materials used, jointing methods, supports, and floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
D. Alternate Products: Alternate manufacturers, equipment and/or products must be specified or approved prior to bid in writing via addendum to be accepted. All costs associated with deviations from the basis of design shall be borne by the contractor. Deviations shall include alternate manufacturer and/or alternate product and shall include all significant dimensional, performance, electrical, or installation differences from the basis of design products. Costs for reimbursement shall include the costs of other trades affected, and shall include all engineering costs to evaluate such deviations.
E. Substitutions: Unspecified manufacturers shall be considered substitutions and shall be submitted for consideration under the specified substitution procedures. Substitutions shall be submitted to the engineer for evaluation. If approved by the engineer, substitution shall be offered to the owner for consideration. All costs associated with substitutions shall be borne by the contractor. Costs for reimbursement shall include the costs of other trades affected, and shall include all engineering costs to evaluate such deviations.
F. Coordination Drawings: Prepare Coordination Drawings (coordinated shop drawings) to maximize utilization of space for efficient installation of different components and for installation of products and materials fabricated by separate entities. Submit to Engineer for review before starting work.
    1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
        a. Indicate functional and spatial relationships of components of the work with all other systems and trades.
        b. Indicate required installation sequences.
        c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide sketches of proposed alternate construction to Engineer for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
G. Project Record Documents: Record actual locations of components and tag numbering.
H. Operation and Maintenance Data: Include installation instructions and spare parts lists.
I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. Refer to Division 01 - Product Requirements, for additional provisions.

1.04 Quality Assurance

A. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years experience. Approved by manufacturer.
B. Conform to UL, FM, and Warnock Hersey requirements.
C. Valves: Bear FM, ITS (DIR), and UL (DIR) product listing label or marking. Provide manufacturer's name and pressure rating marked on valve body.
D. Products Requiring Electrical Connection: Listed and classified as suitable for the purpose specified and indicated.

1.05 Delivery, Storage, and Handling

A. Deliver and store valves in shipping containers, with labeling in place.
B. Provide temporary protective coating on cast iron and steel valves.
C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

1.06 Warranty

A. Refer to Division 01 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 General Requirements

A. Sprinkler-based System:
    1. Comply with NFPA 13.
    2. See Section 21 1300.

B. Standpipe and Hose System:
1. Comply with NFPA 14.
2. See Section 21 1200.
C. Welding Materials and Procedures: Comply with ASME BPVC-IX.
D. Provide system pipes, fittings, sleeves, escutcheons, seals, and other related accessories.

2.02 Buried Piping
A. Ductile Iron Pipe: AWWA C151/A21.51.
1. Fittings: AWWA C110/A21.10, standard thickness.
2. Joints: AWWA C111/A21.11, styrene-butadiene rubber (SBR) or vulcanized SBR gasket.
3. Mechanical Couplings: Shaped composition sealing gasket, steel bolts, nuts, and washers.

2.03 Above Ground Piping
A. Steel Pipe: ASTM A53 Schedule 40, black.
1. Steel Fittings: ASME B16.9 wrought steel, buttwelded or ASTM A234/A234M wrought carbon steel or alloy steel.
2. Malleable Iron Fittings: ASME B16.3, threaded fittings and ASTM A47/A47M.
3. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.
B. CPVC Pipe: ASTM F442/F442M, SDR 13.5 (wet systems only).
1. Fittings: ASTM F438 Schedule 40, or ASTM F439 Schedule 80, CPVC.
2. Joints: Solvent welded, using ASTM F493 cement.

2.04 Pipe Sleeves
A. Vertical Piping:
1. Sleeve Length: 1 inch above finished floor.
2. Provide sealant for watertight joint.
3. Drilled Penetrations: Provide 1-1/2 inch angle ring or square set in silicone adhesive around penetration.
B. Plastic, Sheet Metal, or Moisture-Resistant Fiber: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.
C. Pipe Passing Through Below Grade Exterior Walls:
1. Zinc-coated or cast-iron pipe.
2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.

2.05 Escutcheons
A. Material:
1. Metals and Finish: Comply with ASME A112.18.1.
B. Construction:
1. One-piece for mounting on chrome-plated tubing or pipe and one-piece or split-pattern type elsewhere.
2. Internal spring tension devices or setscrews to maintain a fixed position against a surface.

2.06 Pipe Hangers and Supports
A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
B. Hangers for Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.
C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
D. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.
E. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.
F. Vertical Support: Steel riser clamp.
G. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

2.07 Mechanical Couplings
A. Rigid Mechanical Couplings for Grooved Joints:
1. Dimensions and Testing: Comply with AWWA C606.
2. Minimum Working Pressure: 300 psig.
3. Housing Material: Fabricate of ductile iron complying with ASTM A536.
4. Housing Coating: Factory applied orange enamel.
5. Gasket Material: EPDM suitable for operating temperature range from minus 30 degrees F to 230 degrees F.
6. Bolts and Nuts: Hot-dipped-galvanized or zinc-electroplated steel.
7. Provide stops for direct stab installation without field assembly.

PART 3 EXECUTION

3.01 **FIRE SUPPRESSION DEMOLITION**
A. Refer to Division 01 Section “Cutting and Patching” and Division 02 Section “Selective Structure Demolition” for general demolition requirements and procedures.
B. Disconnect, demolish, and remove fire-suppression systems, equipment and components indicated to be removed.
1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
3. Equipment to Be Removed: Disconnect and cap services and remove equipment.
4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.02 Preparation

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
B. Remove scale and foreign material, from inside and outside, before assembly.
C. Prepare piping connections to equipment with flanges or unions.

3.03 Installation

A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13.
B. Install standpipe piping, hangers, and supports in accordance with NFPA 14.
C. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
D. Install piping to conserve building space, to not interfere with use of space and other work.
E. Group piping whenever practical at common elevations.
F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
G. Inserts:
    1. Provide inserts for placement in concrete formwork.
    2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
    3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
    4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
    5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above slab.
H. Pipe Hangers and Supports:
    1. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
    2. Place hangers within 12 inches of each horizontal elbow.
    3. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
    4. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
    5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
    6. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
I. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
J. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc-rich primer to welding.
K. Do not penetrate building structural members unless indicated.
L. Provide sleeves when penetrating footings, floors, walls, partitions, and rated assemblies. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.
M. Escutcheons:
    1. Install and firmly attach escutcheons at piping penetrations into finished spaces.
    2. Provide escutcheons on both sides of partitions separating finished areas through which piping passes.
    3. Use chrome plated escutcheons in occupied spaces and to conceal openings in construction.
N. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, unions, and couplings for servicing are consistently provided.

3.04 Cleaning

A. Upon completion of work, clean all parts of the installation.
B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

END OF SECTION

SECTION 21 0523 - GENERAL-DUTY VALVES FOR WATER-BASED FIRE-SUPPRESSION PIPING

PART 1 GENERAL

1.01 Section Includes
- A. Two-piece ball valves with indicators.
- B. Check valves.
- C. Bronze OS&Y gate valves.
- D. Iron OS&Y gate valves.
- E. Trim and drain valves.

1.02 Abbreviations and Acronyms
- A. EPDM: Ethylene-propylene diene monomer.
- B. NRS: Non-rising stem.
- C. OS&Y: Outside screw and yoke.
- D. PTFE: Polytetrafluoroethylene.

1.03 Reference Standards
- A. AWWA C606 - Grooved and Shouldered Joints; 2015.
- B. FM (AG) - FM Approval Guide; current edition.
- C. FM 1112 - Examination Standard for Indicating Valves (Butterfly or Ball Type); 2020.
- D. FM 1120/1130 - Approval Standard for Fire Service Water Control Valves (OS&Y and NRS Gate Valves); 1997.
- E. FM 1140 - Approval Standard for Quick Opening Valves 1/4 Inch through 2 Inch Nominal Size; 1998.
- F. FM 1210 - Approval Standard for Swing Check Valves; 2004.
- G. UL (DIR) - Online Certifications Directory; Current Edition.
- H. UL 258 - Shutoff Valves for Trim and Drain Purposes for Fire Protection Service; Current Edition, Including All Revisions.
- I. UL 262 - Gate Valves for Fire-Protection Service; Current Edition, Including All Revisions.
- J. UL 312 - Check Valves for Fire-Protection Service; Current Edition, Including All Revisions.
- K. UL 1091 - Standard for Butterfly Valves for Fire-Protection Service; Current Edition, Including All Revisions.

1.04 Administrative Requirements
- A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.05 Submittals
- A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
- C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listings.

1.06 Quality Assurance
- A. Where listed products are specified, provide products listed, certified, and labeled by FM (AG), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose indicated.

1.07 Delivery, Storage, and Handling

PART 2 PRODUCTS

2.01 General Requirements
- A. UL Listed: Provide valves listed in UL (DIR) under following headings and bearing UL mark.
- B. Comply with NFPA 13 and NFPA 13R for valves.
- C. Valve Pressure Ratings: Not less than minimum pressure rating indicated or higher.
- D. Valve Sizes: Same as upstream piping unless otherwise indicated.
- E. Valve Actuator Types:
  1. Handwheel: For other than quarter-turn trim and drain valves.
  2. Hand-lever: For quarter-turn trim and drain valves 2 NPS and smaller.

2.02 Two Piece Ball Valves with Indicators
- A. UL 1091 and FM 1112 listed.
- B. Description:
  1. Minimum Pressure Rating: 175 psig.
  2. Body Design: Two piece.
  3. Body Material: Forged brass or bronze.
  4. Port Size: Full or standard.
  5. Seat: PTFE.
  6. Stem: Bronze or stainless steel.
  7. Ball: Chrome-plated brass.
  8. Actuator: Worm gear or traveling nut.
  9. End Connections: Threaded or grooved.

2.03 Swing Check Valves
- A. UL 312 and FM 1210 listed.
- B. Minimum Pressure Rating: 175 psig.
- C. Body Material: Cast or ductile iron.
- D. Clapper: Bronze, EPDM-coated ductile iron, or stainless steel.
- E. Seat: Bronze or EPDM-coated bronze.

F. End Connections: Flanged.

2.04 Bronze OS&Y Gate Valves

A. UL 262 and FM 1120/1130 listed.
B. Minimum Pressure Rating: 175 psig.
C. Body and Bonnet Material: Bronze or brass.
D. Wedge: One-piece bronze or brass.
E. Wedge Seat: Bronze.
F. Stem: Bronze or brass.
G. Packing: Non-asbestos PTFE.
H. End Connections: Threaded.

2.05 Iron OS&Y Gate Valves

A. UL 262 and FM 1120/1130 listed.
B. Minimum Pressure Rating: 175 psig.
C. Body and Bonnet Material: Cast or ductile iron.
D. Wedge: Cast or ductile iron, or bronze with elastomeric coating.
E. Stem: Brass, bronze, or stainless steel.
F. Packing: Non-asbestos PTFE.
G. Supervisory Switch: External.

2.06 Trim and Drain Valves

A. Ball Valves:
1. Description:
a. UL 258 or FM 1140 listed.
b. Pressure Rating: 175 psig.
c. Body Design: Two piece.
d. Body Material: Forged brass or bronze.
e. Port Size: Full or standard.
f. Seat: PTFE.
g. Stem: Bronze or stainless steel.
h. Ball: Chrome-plated brass.
i. Actuator: Hand-lever.
j. End Connections: Threaded or grooved.

PART 3 EXECUTION

3.01 Examination

A. Confirm valve interior to be free of foreign matter and corrosion.
B. Remove packing materials.
C. Examine guides and seats by operating valves from the fully open position to the fully closed position.
D. Examine valve threads and mating pipe for form and cleanliness.
E. Examine mating flange faces for conditions that might cause leakage.
1. Check bolting for proper size, length, and material.
2. Verify gasket for size, defects, damage, and suitable material composition for service.
3. Replace defective valves with new valves.

3.02 Installation

A. Install valves in accessible locations to allow for operation, inspections, tests, and maintenance.
B. Install listed valves in accordance with their listing.
C. Install valves in accordance with manufacturer's instructions.
D. Support valves independently of adjacent piping.
E. Install valves in horizontal piping with stem at or above pipe center.
F. Position valves to allow full actuator movement.
G. Install OS&Y valves with full clearance for rising stem. Install surrounding components so they do not interfere with nor are they impacted by full extension of rising stem.
H. Install supervised shutoff valves in supervised-open position.
1. Install permanent identification signs indicating portion of system controlled by each shutoff valve.
2. Install threaded-end valves with unions upstream and downstream.
I. Install valve tags. See Section 21 0553. Label valves in accordance with NFPA standard applying to the piping system in which valves are installed.

END OF SECTION

SECTION 21 0553 - IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates.
B. Tags.
C. Stencils.
D. Pipe markers.
E. Ceiling tacks.

1.02 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2020.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.
C. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
D. Product Data: Provide manufacturers catalog literature for each product required.
E. Manufacturer's Installation Instructions: Indicate special procedures, and installation instructions.
F. Project Record Documents: Record actual locations of tagged valves.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

A. Control Panels: Nameplates.
B. Instrumentation: Tags.
C. Major Control Components: Nameplates.
D. Piping (where exposed or accessible): Pipe markers.
E. Pumps: Nameplates.
F. Small-sized Equipment: Tags.
G. Valves: Nameplates and ceiling tacks where above lay-in ceilings.

2.02 NAMEPLATES

A. Description: Laminated three-layer plastic with engraved letters.

2.03 TAGS

A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.
C. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

2.04 STENCILS

A. Stencils: With clean cut symbols and letters of following size:
   1. 3/4 to 1-1/4 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 1/2 inch high letters.
   2. 1-1/2 to 2 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 3/4 inch high letters.
   3. 2-1/2 to 6 inch Outside Diameter of Insulation or Pipe: 12 inch long color field, 1-1/4 inch high letters.
B. Paint for Stencils: As specified in Section 09 9123, semi-gloss enamel, colors complying with ASME A13.1.

2.05 PIPE MARKERS

A. Color: Comply with ASME A13.1.
B. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.
D. Underground Plastic Pipe Markers: Bright-colored continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mil, 0.004 inch thick, manufactured for direct burial service.

2.06 CEILING TACKS

A. Description: Steel with 3/4 inch diameter color coded head.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.
B. Prepare surfaces in accordance with Section 09 9123 for stencil painting.

3.02 INSTALLATION

A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
B. Install tags with corrosion resistant chain.
C. Apply stencil painting in accordance with Section 09 9123.
D. Install plastic pipe markers in accordance with manufacturer's instructions.
E. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
F. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
G. Locate ceiling tacks to locate valves above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION

SECTION 21 1100 - FACILITY FIRE-SUPPRESSION WATER-SERVICE PIPING

PART 1 GENERAL

1.01 Administrative Requirements

A. Coordination: Coordinate the installation of work with size, location and installation of service utilities.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.02 Submittals

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.

B. Welders Certificate: Include welders certification of compliance with ASME BPVC-IX.

C. Product Data:

1. Include data on pipe materials, pipe fittings, valves, and accessories.
2. Provide manufacturer's catalog information.
3. Indicate valve data and ratings.

D. Field Quality Control Submittals: Testing activities.

E. Project Record Documents:

1. Record actual locations of piping mains, valves, connections, fire hydrants, free-standing fire department connections, underground manholes and vaults, valve boxes, thrust restraints, and invert elevations.
2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

F. Maintenance Data: Include installation instructions, spare parts lists, and exploded assembly views.

1.03 Quality Assurance

A. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years documented experience.

B. Provide grooved joint couplings, fittings, valves, specialties, and grooving tools from a single manufacturer.

C. Perform Work in accordance with Local Authority Having Jurisdiction, local municipality, local water utility, and Owner's requirements.

1.04 Delivery, Storage, and Handling

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary protective coating on cast iron and steel valves.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

1.05 Field Conditions

A. Do not install underground piping when bedding is wet or frozen.

1.06 Warranty

A. Refer to Division 01 - Closeout Submittals for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide ten year warranty for manufacturer's defects and labor costs for replacement.

PART 2 PRODUCTS

2.01 Water Pipe

A. Steel Pipe: ASTM A53/A53M, Grade B, Type F. Provide standard weight, zinc-coated, and listed piping.

1. Fittings: Comply with ASME B16.3, Class 150, zinc coated, threaded or ASME B16.4, Class 125, zinc-coated.
2. Mechanically Factory Applied Protective Materials:
   a. Clean by wire brushing and solvent cleaning.
   b. Apply one coat of coal-tar primer and two coats of coal-tar enamel complying with AWWA C203.
   c. Protect threaded pipe ends and fittings prior to coating.

B. Ductile Iron Pipe: Listed, AWWA C104/A21.4:

1. Fittings: Ductile iron, standard thickness.
2. Joints: AWWA C111/A21.11, styrene-butadiene rubber (SBR) or vulcanized SBR gasket with rods.
3. Jackets: AWWA C105/A21.5 polyethylene jacket.

C. Ductile Iron Pipe: Listed, AWWA C151/A21.51.

1. Fittings: AWWA C110/A21.10, ductile iron, standard thickness.
2. Joints: AWWA C111/A21.11, styrene-butadiene rubber (SBR) or vulcanized SBR rubber gasket with 3/4 inch diameter rods.

2.02 Valves

A. General:

1. Manufacturer's name and pressure rating marked on valve body.
2. Minimum Compliance: UL (DIR) listed and labeled.
3. Maximum Inlet Pressure: 400 psi.
4. Maximum Service Temperature: 180 degrees F.
5. Valve Coatings:
   a. Internally: 4 mils, 0.004 inch epoxy, minimum.
   b. Externally: Epoxy base then fire red enamel paint or heat-fused red epoxy paint.

B. Detector Check with Water Meter:

1. Manufacturers:
   a. Badger Meter, Inc: www.badgermeter.com.
   b. FEBCO: www.febcoonline.com.
   c. Watts Water Technologies, Inc: www.wattswater.com.
   d. Substitutions: Refer to Divsion 01 - Product Requirements.
2. 4 inch NPS to 10 inch NPS:

a. Description: Double check valve, water meter, by-pass piping, and isolation valves designed to measure both low flow and high water volume usage.
1) Valve Body: Comprised of epoxy coated stainless steel, ductile iron, or cast iron.
2) Valve Ends: Flanged.

PART 3 EXECUTION

3.01 Examination

A. Verify that building service connection and municipal utility water main size, location, and invert are as indicated.

3.02 Preparation

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.
B. Remove scale and dirt on inside and outside before assembly.
C. Prepare pipe connections to equipment with flanges or unions.

3.03 Trenching

A. Earthwork: Perform earthwork operations in accordance with Sections 31 2316, 31 2316.13, and 31 2323.
B. Hand trim excavation for accurate placement of pipe to elevations indicated.
C. Form and place concrete for pipe thrust restraints at each change of pipe direction. Place concrete to permit full access to pipe and pipe accessories. Provide [4] sq feet thrust restraint bearing on subsoil.
D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.04 Installation

A. General Requirements:
1. Location of Water Lines:
a. Terminate the work covered by this Section at a point approximately 5 feet from the building unless indicated otherwise.
2. Sleeving:
a. Sleeve water piping where piping is required to be installed within 3 feet of existing structures.
b. Provide ductile iron or Schedule 40 steel sleeves.
c. Fill annular space between pipe and sleeves with mastic.
d. Install water pipe and sleeve without damaging structures or causing settlement or movement of foundations or footings.
3. Pipe Laying and Jointing:
a. Remove fins and burrs from pipe and fittings.
b. Prior to placing in position, clean pipe, fittings, valves, and accessories, and maintain in clean condition.
c. Provide proper facilities for lowering pipe sections into trenches.
d. Dropping or dumping of piping, fittings, valves, or any other water line material into trenches is not permitted.
e. Cut pipe in a neat, workmanlike manner accurately to length established at the site and work into place without forcing or springing.
f. Replace by one of the proper length any pipe or fitting that does not allow sufficient space for proper installation of jointing material.
g. Wedging or blocking between bells and spigots will not be permitted.
h. Install bell-and-spigot pipe with the bell end pointing in the direction of laying.
i. Grade the pipeline in straight lines avoiding the formation of dips and low points.
j. Support piping at proper elevation and grade.
k. Secure firm, uniform support.
l. Wood support blocking will not be permitted.
m. Install pipe so that the full length of each pipe section and each fitting will rest solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings.
n. Provide anchors and supports where necessary for fastening work into place.
o. Provide proper provisions for expansion and contraction of pipelines.
p. Keep trenches free of water until joints have been properly made.
q. Close open ends of piping temporarily with wood blocks or bulkheads at the end of each workday.
r. Do not install pipe during unacceptable trench conditions or inclement weather.
s. Minimum Depth of Pipe Cover: Not less than 2-1/2 feet.
4. Connections to Existing Water Lines:
a. Ensure minimal interruption of service on the existing line.
b. Make connections to existing lines under pressure in accordance with the recommended procedures of the manufacturer of the pipe being tapped.
5. Penetrations:
a. Provide ductile-iron or Schedule 40 steel for pipes passing through walls of valve pits and structures.
b. Fill annular space between sleeves and walls with rich cement mortar.
c. Fill annular space between pipe and sleeves with mastic.

B. Special Requirements:
1. Ductile Iron Piping:
a. Unless otherwise specified, install pipe and fittings in accordance with paragraph "General Requirements".
b. Jointing.
c. Allowable Deflection:
1) Maximum Allowable Deflection: As stated in AWWA C600.
2) If the alignment requires deflection in excess of the above limitations, furnish special blends or a sufficient number of shorter pipe lengths to provide angular deflections within the limit set forth.

d. Pipe Anchorage:
1) Provide concrete thrust blocks (reaction backing), for pipe anchorage except where metal harness is indicated.
2) Thrust blocks to comply with the requirements of AWWA C600 for thrust restraint, except that size and positioning of thrust blocks to be as indicated.
3) Use concrete, ASTM C94/C94M, having a minimum compressive strength of 2,500 psi at 28 days; or use concrete of a mix not leaner than one part cement, 2-1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength.
4) Provide metal harness in accordance with the requirements of AWWA C600 for thrust restraint, using tie rods and clamps as indicated in NFPA 13, except as otherwise indicated.

e. Exterior Protection: Completely encase buried ductile iron pipelines with polyethylene tube or sheet, using Class A polyethylene film, in accordance with AWWA C105/A21.5.

2. Steel Piping:
a. Jointing:
1) Assemble grooved and shouldered type joints in accordance with the recommendations of the coupling manufacturer.

b. Allowable Offsets.

c. Pipe Anchorage:
1) Provide concrete thrust blocks (reaction backing) for pipe anchorage, except where metal harness is indicated.
2) Thrust blocks to be in accordance with the recommendations for thrust restraint in AWWA M11, except that size and positioning of thrust blocks are to be as indicated.
3) Use ASTM C94/C94M concrete having a minimum compressive strength of 2500 psi at 28 days; or use concrete of a mix not leaner than one part cement, 2-1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength.
4) Metal Harness:
(a) Provide in accordance with the recommendations for joint harnesses in AWWA M11, except as otherwise indicated.
(b) Fabricated by the pipe manufacturer and furnished with the pipe.

C. Valves:
1. Set valves on solid bearing.
2. Center and plumb valve box over valve.
3. Set box cover flush with finished grade.

D. Water Meters:
1. Install in accordance with the requirements of the Local Authority Having Jurisdiction and local water utility.

E. Free-Standing Fire Department Connections:
1. Install in accordance with NFPA 13 and the Local Authority Having Jurisdiction.
2. Fire Department Connection to Main: Install ball drip valves at each check valve.
3. Protective Pipe Bollards:
a. Install on 3 sides of each fire department connection.
b. See Section 05 5000.

3.05 Service Connections
A. Provide fire water service to Local Authority Having Jurisdiction requirements with reduced pressure backflow preventer and water meter with by-pass valves and sand strainer.
B. Anchor fire service main to interior surface of foundation wall.

3.06 Field Quality Control
A. Field Tests and Inspections:
1. Refer to Division 01 - Quality Requirements, for additional requirements.
2. Provide all labor, equipment, and incidentals required for field testing, except that water and electric power needed for field tests will be furnished as set forth in Division 01 - Temporary Utilities.
3. Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently and at least 5 days after placing of concrete after concrete thrust blocks have hardened sufficiently and at least 5 days after placing of concrete.
4. Fill pipeline 24 hours before testing and apply test pressure to stabilize system, using only potable water.
5. Test water piping in accordance with NFPA 13, where the additional water added to the system must not exceed the limits given in NFPA 13.
6. Pressure test piping to 100 psi.
7. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.
8. Prepare reports of testing activities.

3.07 Closeout Activities
A. Refer to Division 01 - Closeout Submittals, for closeout submittals.
B. Refer to Division 01 - Demonstration and Training, for additional requirements.
C. Demonstrate proper operation of equipment to Owner's designated representative.

END OF SECTION

SECTION 21 1300 - FIRE-SUPPRESSION SPRINKLER SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wet-pipe sprinkler system.
B. System design, installation, and certification.
C. Fire department connections.

1.02 REFERENCE STANDARDS

A. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2015.
B. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry Elements; 2015.
C. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2015.
D. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2016.
E. ITS (DIR) - Directory of Listed Products; current edition.
F. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
G. UL 405 - Standard for Safety Fire Department Connection Devices; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
C. Shop Drawings:
   1. Submit preliminary layout of finished ceiling areas indicating only sprinkler locations coordinated with ceiling installation.
   2. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components, and accessories. Indicate system controls.
   3. Submit shop drawings to Authorities Having Jurisdiction for approval. Submit proof of approval to Architect.
D. Samples: Submit two of each style of sprinkler specified.
E. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.
F. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.
G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Refer to Division 01 - Product Requirements, for additional provisions.
   2. Extra Sprinklers: Type and size matching those installed in quantity required by referenced NFPA design and installation standard.
   3. Sprinkler Wrenches: For each sprinkler type.
H. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.

1.05 QUALITY ASSURANCE

A. Maintain one copy of referenced design and installation standard on site.
B. Comply with FM (AG) requirements.
C. Designer Qualifications: Design system under direct supervision of a Professional Engineer and/or state licensed experienced in design of this type of work and licensed in the State in which the Project is located.
D. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
E. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sprinklers, Valves, and Equipment:
   1. Tyco Fire Protection Products: www.tyco-fire.com.
   2. Viking Corporation: www.vikinggroupinc.com.
   3. Reliable.
   4. Substitutions: Refer to Division 01 - Product Requirements.

2.02 SPRINKLER SYSTEM

A. Sprinkler System: Provide coverage for entire building.
B. Non-residential Occupancy: Comply with NFPA 13.
C. Water Supply: Determine volume and pressure from water flow test data.
D. Provide fire department connections where indicated.
E. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

2.03 SPRINKLERS

A. Suspended Ceiling Type: Concealed pendant type with matching push on escutcheon plate.
   1. Response Type: Quick.
   2. Coverage Type: Standard.

3. Finish: Enamel, color White .
4. Escutcheon Plate Finish: Enamel, color as selected.
5. Fusible Link: Glass bulb type temperature rated for specific area hazard.

B. Exposed Area Type: Upright type.
1. Response Type: Quick.
2. Coverage Type: Extended.
3. Fusible Link: Glass bulb type temperature rated for specific area hazard.

C. Sidewall Type: Semi-recessed horizontal sidewall type with matching push on escutcheon plate.
1. Response Type: Quick.
2. Coverage Type: Extended.
3. Finish: Enamel, color White .
4. Escutcheon Plate Finish: Enamel, color as selected.
5. Fusible Link: Glass bulb type temperature rated for specific area hazard.

D. Residential Sprinklers: Concealed upright type with matching push on escutcheon plate.
1. Response Type: Quick.
2. Finish: Enamel, color White .
3. Cover Plate Finish: Enamel, color as selected.
4. Fusible Link: Glass bulb type temperature rated for specific area hazard.

2.04 PIPING SPECIALTIES

A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber-faced clapper to automatically actuate water motor alarm, pressure retard chamber and variable pressure trim with the following additional capabilities and features:
1. Activate electric alarm.
2. Test and drain valve.
3. Replaceable internal components without removing valve from installed position.
4. Manufacturers:
a. Victaulic Company; Series 751 with Series 760 motor alarm: www.victaulic.com/#sle.
b. Substitutions: Refer to Division 01 - Product Requirements.

B. Antifreeze Systems: Include UL listed pre-mixed solution for areas subject to freezing with the following additional capabilities and features:
1. Backflow preventer at connection point and expansion tank sized for temperature range.
2. Fill valve, funnel, and test/air vent valve at top of system.
3. Test and drain valves at lowest and most remote points of system.

C. Backflow Preventer: Reduced pressure principle valve assembly backflow preventer with drain and OS & Y gate valve on each end.

D. Test Connections:
1. Backflow Preventer Test Connection:
a. Provide downstream of the backflow prevention assembly, listed hose valves with 2.5 inch National Standard male hose threads with cap and chain.
b. Furnish one valve for each 250 gpm of system demand or fraction thereof.
c. Provide permanent sign reading "Test Valve" in accordance with Section 21 0553.

E. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated 10 amp at 125 volt AC and 2.5 amp at 24 volt DC.

F. Fire Department Connections:
1. Type: Free standing made of corrosion resistant metal complying with UL 405.
a. Sleeve: Brass, 18 inches height.
b. Signage: Raised or engraved lettering 1 inch minimum indicating system type.
c. Manufacturers:
1) Elkhart Brass Manufacturing Company, Inc: www.elkhartbrass.com.
2) Substitutions: Refer to Division 01 - Product Requirements.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with referenced NFPA design and installation standard.
B. Install equipment in accordance with manufacturer's instructions.
C. Provide approved double check valve assembly at sprinkler system water source connection.
D. Place pipe runs to minimize obstruction to other work.
E. Place piping in concealed spaces above finished ceilings.
F. Center sprinklers in two directions in ceiling tile and provide piping offsets.
G. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
H. Flush entire piping system of foreign matter.
I. Install guards on sprinklers where indicated.
J. Hydrostatically test entire system.
K. Require test be witnessed by Fire Marshal and Authority Having Jurisdiction.

3.02 INTERFACE WITH OTHER PRODUCTS

A. Ensure required devices are installed and connected to fire alarm system.

END OF SECTION

SECTION 22 0050 - PLUMBING EXECUTION

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the following:
   1. Definitions.
   2. Coordination.
   3. Piping materials and installation instructions common to most piping systems.
   4. Dielectric fittings.
   5. Mechanical sleeve seals.
   6. Sleeves.
   7. Escutcheons.
   8. Grout.
   9. Plumbing demolition.
   10. Equipment installation requirements common to equipment sections.
   11. Concrete bases.
   12. Supports and anchorages.

1.02 RELATED DOCUMENTS

A. Drawings, General Provisions of the Contract, including General Conditions, Supplementary General Conditions, other Division 00 & 01 Specification Sections, shall apply to this division.

B. These requirements apply to all Division 22 work.

1.03 DEFINITIONS

A. Finished Spaces: Spaces other than plumbing and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and plumbing equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.04 COORDINATION

A. Coordination: Coordinate construction operations to ensure efficient and orderly installation of the Work.
   1. Coordinate construction operations, that depend on each other for proper installation, connection, and operation.
   2. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   3. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
   4. Make adequate provisions to accommodate items scheduled for later installation.
   5. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Construction Schedule.
   2. Preparation of the Schedule of Values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Preinstallation conferences.
   7. Project closeout activities.
   8. Startup and adjustment of systems.
   9. Project closeout activities.

1.05 PROJECT MEETINGS

A. General: Attend meetings and conferences at Project site, unless otherwise indicated.
   1. Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Engineer of scheduled meeting dates and times.
   2. Agenda: Request the meeting agenda if not furnished prior to meeting.
   3. Minutes: Record significant discussions and agreements achieved. Request the meeting minutes if not furnished. Note all discrepancies and notify Engineer of all changes to the Work or to the Contract Documents.

B. Preconstruction Conference: Attend the preconstruction conference before starting construction, no later than 15 days after execution of the Agreement to review responsibilities and personnel assignments.

1. Attendees: Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following as applicable:
   a. Tentative construction schedule.
   b. Phasing.
   c. Critical work sequencing and long-lead items.
   d. Designation of key personnel and their duties.
   e. Procedures for processing field decisions and Change Orders.
   f. Procedures for requests for interpretations (RFIs).
   g. Procedures for testing and inspecting.
   h. Procedures for processing Applications for Payment.
   i. Distribution of the Contract Documents.
   j. Submittal procedures.
   k. LEED requirements.
   l. Preparation of Record Documents.
   m. Use of the premises.
   n. Work restrictions.
   o. Owner's occupancy requirements.
   p. Responsibility for temporary facilities and controls.
   q. Construction waste management and recycling.
   r. Parking availability.
   s. Office, work, and storage areas.
   t. Equipment deliveries and priorities.
   u. First aid.
   v. Security.
   w. Progress cleaning.
   x. Working hours.

C. Preinstallation Conferences: Attend a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following as applicable:
   a. The Contract Documents.
   b. Options.
   c. Related requests for interpretations (RFIs).
   d. Related Change Orders.
   e. Purchases, deliveries, submittals.
   f. Review of mockups.
   g. Possible conflicts.
   h. Compatibility problems.
   i. Time schedules.
   j. Weather limitations.
   k. Manufacturer's written recommendations.
   l. Warranty requirements.
   m. Compatibility of materials.
   n. Acceptability of substrates.
   o. Space and access limitations.
   p. Regulations of authorities having jurisdiction.
   q. Testing and inspecting requirements.
   r. Installation procedures.
   s. Coordination with other work.
   t. Required performance results.
   u. Protection of adjacent work.
   v. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present, to parties who should have been present, and to the Engineer.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

1.06 SUBMITTALS

A. Alternate Products: Alternate manufacturers, equipment and/or products must be specified or approved prior to bid in writing via addendum to be accepted. All costs associated with deviations from the basis of design shall be borne by the contractor. Deviations shall include alternate manufacturer and/or alternate product and shall include all

significant dimensional, performance, electrical, or installation differences from the basis of design products. Costs for reimbursement shall include the costs of other trades affected, and shall include all engineering costs to evaluate such deviations.

B. Substitutions: Unspecified manufacturers shall be considered substitutions and shall be submitted for consideration under the specified substitution procedures. Substitutions shall be submitted to the engineer for evaluation. If approved by the engineer, substitution shall be offered to the owner for consideration. All costs associated with substitutions shall be borne by the contractor. Costs for reimbursement shall include the costs of other trades affected, and shall include all engineering costs to evaluate such deviations.

C. Coordination Drawings: Prepare Coordination Drawings (coordinated shop drawings) to maximize utilization of space for efficient installation of different components and for installation of products and materials fabricated by separate entities. Submit to Engineer for review before starting work.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:

a. Indicate functional and spatial relationships of components of the work with all other systems and trades.

b. Indicate required installation sequences.

c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide sketches of proposed alternate construction to Engineer for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

D. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project. Submit to Engineer before starting work.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

E. Make all necessary field measurements and investigations to assure that the equipment and assemblies will meet contract requirements.

F. If equipment is submitted which differs in arrangement from that shown, provide drawings that show the rearrangement of all associated systems. Approval will be given only if all features of the equipment and associated systems, including accessibility, are equivalent to that required by the contract.

G. Prior to submitting shop drawings for review, contractor shall certify in writing that manufacturers of all major items of equipment have each reviewed drawings and specifications, and have jointly coordinated and properly integrated their equipment and controls to provide a complete and efficient installation.

1.07 Warranties

A. All work shall include a parts and labor warranty on materials and workmanship for a period of 1 year.

B. Refer to Division 01 for additional warranty requirements.

PART 2 PRODUCTS

2.01 SLEEVES

A. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

B. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop.

C. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include underdeck clamp, clamping ring with set screws, nuts, and bolts for membrane flashing.

D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."

2.02 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.

1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.

2. Design Mix: 5000-psi, 28-day compressive strength.

3. Packaging: Premixed and factory packaged.

2.03 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

B. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

C. Pressure Plates: Carbon steel. Include two for each sealing element.

D. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

E. The use of "Thum-Gum" and other similar materials/products as a sealant at penetrations shall not be permitted.

2.04 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.

C. One-Piece, Cast-Brass Type: With set screw.

1. Finish: Polished chrome-plated.

D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
   1. Finish: Polished chrome-plated.

2.05 PIPE, TUBE, AND FITTINGS

A. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.06 JOINING MATERIALS

A. Pipe-Flange Gasket Materials: ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
B. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
C.]Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
D. Brazing Filler Metals: AWS A5.8, BCuP Series or BAg1, unless otherwise indicated.
E. Welding Filler Metals: Comply with AWS D10.12.
F. Solvent Cements for Joining Plastic Piping:
   1. CPVC Piping: ASTM F 493.
   2. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

2.07 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
B. Insulating Material: Suitable for system fluid, pressure, and temperature.
C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.
D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig minimum working pressure to suit system pressures.
E. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.
F. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.

PART 3 EXECUTION

3.01 COMMON REQUIREMENTS

A. Install according to manufacturer requirements and other Division specification sections.
B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas. Where located within walls and other concealed areas subject to damage, provide suitable protection.
D. Piping indicated to be exposed and piping in equipment rooms and service areas shall be at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
F. Materials exposed within plenums shall be noncombustible or have a flame spread index of 25 or less and a smoke-developed index of 50 or less.
G. Install piping and equipment with clearances to permit servicing.
H. Install piping at indicated slopes free of sags and bends and with fittings for branch connections and changes in direction.
I. Install piping to allow application of insulation.
J. Select system components with pressure rating equal to or greater than system operating pressure.
K. Contact manufacturer's representative to visit site and observe installation in order to confirm installation requirements and warranty coverage. Document observation in writing and include in O&M manuals.
L. Provide service and maintenance for not less than one year from the Date of Substantial Completion or for the warranty period specified in Division 01, whichever is longer. Refer to Division 01 for additional service and requirements.

3.02 PENETRATIONS

A. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls. Sleeve ends shall be flush with both wall surfaces unless otherwise noted. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Concrete and masonry penetrations: seal space outside of sleeves with grout. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
B. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
C. Roof-Penetrations: Seal penetration of roof with flexible boot-type flashing units applied in coordination with roofing work.
D. Aboveground, Exterior-Wall Pipe Penetrations: Position pipe in center of sleeve. Maintain 1% outward slope, unless otherwise indicated. Seal penetrations using non-expanding foam. After cured, trim flush with sleeve end and paint with color to match surrounding finish.
E. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

F. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at. Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07. "Comply with requirements in Division 07."
G. Apply firestopping to non-ducted penetrations of fire and/or smoke rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07.
H. Penetrations of membranes of rated walls shall be protected by UL listed products. Coordinate exact installation conditions with selected fire sealants supplier. For penetrations which do not have a standard UL installation detail, arrange for engineering determination from damper manufacturer and/or sealant supplier and provide modifications required to match detail.
I. Install escutcheons for penetrations of walls, ceilings, and floors.

3.03 PIPING JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
C. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
D. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
E. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
F. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
G. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
H. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
   1. Comply with ASTM F 402, for safe-handling practice of cleaners, primers, and solvent cements.
   2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
   3. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
   4. PVC Nonpressure Piping: Join according to ASTM D 2855.
I. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
J. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.
K. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
   1. Plain-End Pipe and Fittings: Use butt fusion.
   2. Plain-End Pipe and Socket Fittings: Use socket fusion.
L. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.04 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:
   1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
   2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
   3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
   4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.05 **INSTALLATION - COMMON REQUIREMENTS**

A. Install equipment, fixtures, valves and specialties according to manufacturer installation instructions and recommendations.
B. Refer to other Sections of these Specifications for additional requirements.
C. Install to allow maximum possible headroom unless specific mounting heights are indicated.
D. Install work level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
E. Install work to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
F. Install work to allow right of way for piping installed at required slope.
G. Contact equipment manufacturer's representative to visit site and observe installation in order to confirm installation requirements and warranty coverage. Document observation in writing and include in O&M manuals.

H. Provide service and maintenance for not less than one year from the Date of Substantial Completion or for the warranty period specified in Division 01, whichever is longer. Refer to Division 01 for additional service and requirements.

3.06 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
   1. Provide concrete bases which are plumb, level and fully supported to prevent shifting over time.
   2. Provide concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
   3. Place and secure anchorage devices. Install according to equipment manufacturer's recommendations, setting drawings, templates, diagrams, instructions, and directions for supported equipment. Provide anchor bolts according to anchor-bolt manufacturer's written instructions. Install anchor bolts to elevations required for proper attachment to supported equipment. Unless otherwise noted, install epoxy-coated anchor bolts to match equipment that extend through concrete base, and anchor into structural concrete.
   4. Where located on structural floor, provide dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of the base.
   5. Provide 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section "Cast-in-Place Concrete."

3.07 SUPPORTS AND ANCHORAGES

A. Provide supports to match construction type and adjacent assembly rating.
B. For combustible construction, provide wood supports and anchorages. Cut, fit, and place nailers, blocking, and anchorages to support, and anchor materials and equipment. Select fasteners that will not penetrate members to opposite side. Tighten connections between members. Install fasteners without splitting wood members.
C. For non-combustible building construction provide metal supports and anchorages. Refer to Division 05 Section "Metal Fabrications" for structural steel. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment. Field Welding shall comply with AWS D1.1.
D. Attach to substrates to support applied loads.

3.08 GROUTING

A. Clean surfaces that will come into contact with grout. Provide forms for placement of grout.
B. Mix and install grout for HVAC equipment base bearing surfaces, and anchors.
C. Place grout around anchors and completely filling equipment base and provide smooth bearing surface for equipment. Avoid air entrapment during placement of grout.
D. Allow grout to cure before loading or applying forces.

3.09 SLEEVE-SEAL INSTALLATION

A. Install to seal below-grade exterior wall penetrations.
B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

END OF SECTION 220500

SECTION 22 0516 - EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flexible pipe connectors.

B. Pipe loops, offsets, and swing joints.

1.02 REFERENCE STANDARDS

A. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2015a (Reapproved 2019).

B. EJMA (STDS) - EJMA Standards; Tenth Edition.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Record installed locations of flexible pipe connectors, expansion joints, anchors, and guides.

PART 2 PRODUCTS

2.01 **FLEXIBLE PIPE CONNECTORS**

A. Manufacturers:

1. Mercer Rubber Company: www.mercer-rubber.com.
2. The Metraflex Company: www.metraflex.com/#sle.
3. Substitutions: See Section 01 6000 - Product Requirements.

B. Inner Hose: Stainless steel.

C. Exterior Sleeve: Single braided, stainless steel.

D. Pressure Rating: 125 psi up to 12 inch.

E. Joint: As specified for pipe joints.

F. Size: Use pipe sized units.

G. Maximum offset: 3/4 inch on each side of installed center line.

2.02 **FLEXIBLE JOINTS AND LOOPS - HOSE AND BRAID**

A. Provide flexible loops with two flexible sections of hose and braid, two 90 degree elbows, and 180 degree return with support brackets and plugged drain port for steam service.

B. Maximum Allowable Motion: 2 inch in the x, y, and z planes with no thrust loads to the building structure.

C. Construction: Class 150, schedule 40, stainless steel hose and braid assembly with carbon steel fittings, including elbows and flanged end connections sized to match pipe segment.

1. Provide necessary accessories including, but not limited to, swivel joints.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with EJMA (Expansion Joint Manufacturers Association) Standards.

C. Install flexible pipe connectors on pipes connected to vibration isolated equipment. Provide line size flexible connectors.

D. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.

E. Provide support and pipe loops to control expansion and contraction of piping. Provide where straight run > 50' to allow 3" of expansion per 50' of length for DCW, .6" per 50' for DHW.

F. Substitute grooved piping for vibration isolated equipment instead of flexible connectors. Grooved piping need not be anchored.

END OF SECTION

PART 2 PRODUCTS

END OF SECTION

SECTION 22 0519 - METERS AND GAUGES FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pressure gauges.

1.02 REFERENCE STANDARDS

A. ASME B40.100 - Pressure Gauges and Gauge Attachments; 2013.

B. ASTM E1 - Standard Specification for ASTM Liquid-in-Glass Thermometers; 2014 (Reapproved 2020).

C. UL 393 - Indicating Pressure Gauges for Fire-Protection Service; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide red-marked product data sheets for each furnished item with associated components and accessories.

PART 2 PRODUCTS

2.01 PRESSURE GAUGES

A. Manufacturers:

1. Dwyer Instruments, Inc: www.dwyer-inst.com.
2. Moeller Instrument Company, Inc: www.moellerinstrument.com.
3. Omega Engineering, Inc: www.omega.com.
4. Substitutions: Refer to Division 01 - Product Requirements.

B. Bourdon Tube for Liquids and Gases:

1. Dial Size and Cover: 4-1/2 inch diameter scale with polycarbonate window.
2. Dial Text and Markings: Black color on white background with scaled kPa and psi units.
3. Accuracy: ASME B40.100, adjustable commercial grade (D) with 5 percent of span.
4. Process Connection: Lower-back, 1/4 inch NPT male except where noted.

2.02 STEM TYPE THERMOMETERS

A. Manufacturers:

1. Dwyer Instruments, Inc: www.dwyer-inst.com.
2. Omega Engineering, Inc: www.omega.com.
3. Weksler Glass Thermometer Corp: www.wekslerglass.com.
4. Substitutions: Refer to Division 01 - Product Requirements.

B. Thermometers - Adjustable Angle: Red- or blue-appearing non-toxic liquid in glass; ASTM E1; lens front tube, cast aluminum case with enamel finish, cast aluminum adjustable joint with positive locking device; adjustable 360 degrees in horizontal plane, 180 degrees in vertical plane.

1. Size: 9 inch scale.
2. Window: Clear Lexan.
3. Accuracy: 2 percentper ASTM E77.
4. Calibration: Degrees F.

2.03 DIAL THERMOMETERS

A. Manufacturers:

1. Dwyer Instruments, Inc: www.dwyer-inst.com.
2. Omega Engineering, Inc: www.omega.com.
3. Weksler Glass Thermometer Corp: www.wekslerglass.com.
4. Substitutions: Refer to Division 01 - Product Requirements.

B. Thermometers - Adjustable Angle: Dial type bimetallic actuated; ASTM E1; stainless steel case, adjustable angle with front recalibration, silicone fluid damping, white with black markings and black pointer, hermetically sealed lens, stainless steel stem.

1. Size: 5 inch diameter dial.
2. Accuracy: 1 percent.
3. Calibration: Degrees F.

2.04 THERMOMETER SUPPORTS

A. Socket: Brass separable sockets for thermometer stems with or without extensions, and with cap and chain.

B. Flange: 3 inch outside diameter reversible flange, designed to fasten to sheet metal air ducts, with brass perforated stem.

2.05 STATIC PRESSURE GAUGES

A. Manufacturers:

1. Dwyer Instruments, Inc: www.dwyer-inst.com.
2. Omega Engineering, Inc: www.omega.com.
3. Weksler Glass Thermometer Corp: www.wekslerglass.com.
4. Substitutions: Refer to Division 01 - Product Requirements.

B. 3-1/2 inch diameter dial in metal case, diaphragm actuated, black figures on white background, front recalibration adjustment, 2 percent of full scale accuracy.

C. Accessories: Static pressure tips with compression fittings for bulkhead mounting, 1/4 inch diameter tubing.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install metering products in accordance with manufacturer's instructions for intended fluid type and service.

B. Install pressure gages with pulsation dampers. Provide gage cock to isolate each gage. Extend nipples and siphons to allow clearance from insulation.

C. Locate PT (pressure-temperature) test plugs adjacent to control device sockets.

3.02 SCHEDULES

A. Pressure Gauges, Location and Scale Range:
   1. Pumps, 0 to 100 psi.
   2. Expansion tanks, 0 to 100 psi.
   3. Standpipe, highest points, 0 to 150 psi.
   4. Standpipe and sprinkler water supply connection, 0 to 100 psi.
   5. Sprinkler system, 0 to 100 psi.
   6. Pressure reducing valves, 0 to 100 psi.
   7. Backflow preventers, 0 to 100 psi.

B. Pressure Gauge Tappings, Location:

C. Thermometers, Location and Scale Range:
   1. Headers to central equipment, 0 to 150 degrees F.
   2. Domestic hot water supply and recirculation, 0 to 150 degrees F.

END OF SECTION

SECTION 22 0523 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Ball valves.
B. Butterfly valves.
C. Check valves.
D. Gate valves.
E. Lubricated plug valves.

1.02 REFERENCE STANDARDS

A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2018.
B. ASME B31.9 - Building Services Piping; 2020.
C. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2003 (Reapproved 2021).
D. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings; 2004 (Reapproved 2019).
E. ASTM B61 - Standard Specification for Steam or Valve Bronze Castings; 2015 (Reapproved 2021).
F. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings; 2017.
G. MSS SP-67 - Butterfly Valves; 2017, with Errata.
H. MSS SP-78 - Gray Iron Plug Valves, Flanged and Threaded Ends; 2011.
I. MSS SP-80 - Bronze Gate, Globe, Angle, and Check Valves; 2019.
J. NSF 61 - Drinking Water System Components - Health Effects; 2020.
K. NSF 372 - Drinking Water System Components - Lead Content; 2020.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

1.04 QUALITY ASSURANCE

A. Manufacturer:
   1. Obtain valves for each valve type from single manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:
   1. Minimize exposure of operable surfaces by setting plug and ball valves to open position.
   2. Protect valve parts exposed to piped medium against rust and corrosion.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. See drawings for specific valve locations.
B. Listed pipe sizes shown using nominal pipe sizes (NPS) and nominal diameter (DN).
C. Provide the following valves for the applications if not indicated on drawings:
   1. Shutoff: Ball, butterfly, gate or plug.
   2. Throttling: Provide ball type balancing valve with gauge taps and scale.
D. Substitutions of valves with higher CWP classes or WSP ratings for same valve types are permitted when specified CWP ratings or WSP classes are not available.
E. Domestic, Hot and Cold Water Valves:
   1. 2 inch and Smaller:
      a. Bronze: Provide with solder-joint or threaded ends.
      b. Ball: One piece, full port, bronze with brass trim.
      c. Bronze Swing Check: Class 125, bronze disc.
      d. Bronze Gate: Class 125, NRS.
   2. 2-1/2 inch and Larger:
      a. Iron, 2-1/2 NPS to 4 NPS: Provide with threaded or flanged ends.
      b. Iron Grooved-End Butterfly: 175 CWP.
      c. Iron Gate: Class 125, NRS.

2.02 GENERAL REQUIREMENTS

A. Valve Pressure and Temperature Ratings: No less than rating indicated; as r for system pressures and temperatures.
B. Valve Sizes: Match upstream piping unless otherwise indicated.
C. Valve Actuator Types.
D. Insulated Piping Valves: With 2 inch stem extensions and the following features:
   1. Gate Valves: Rising stem.
   2. Ball Valves: Extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
   3. Butterfly Valves: Extended neck.
   4. Memory Stops: Fully adjustable after insulation is installed.
E. Valve-End Connections.
F. General ASME Compliance:
   1. Solder-joint Connections: ASME B16.18.
   2. Building Services Piping Valves: ASME B31.9.
G. Potable Water Use:
   1. Certified: Approved for use in compliance with NSF 61 and NSF 372.

2. Lead-Free Certified: Wetted surface material includes less than 0.25 percent lead content.

H. Source Limitations: Obtain each valve type from a single manufacturer.

2.03 IRON, GROOVED-END BUTTERFLY VALVES

A. CWP Rating: 175 psi.

1. Comply with MSS SP-67, Type I.
2. Body: Coated ductile iron.
3. Stem: Two-piece stainless steel.
4. Disc: Coated ductile iron.
5. Disc Seal: EPDM.

2.04 BRONZE, LIFT CHECK VALVES

A. General:

1. Fabricate from dezincification resistant material.
2. Copper alloys containing more than 15 percent zinc are not permitted.

B. Class 125:

1. Comply with MSS SP-80, Type 1, Metal Disc to Metal Seat and Type 2, Nonmetallic Disc to Metal Seat.
2. CWP Rating: 200 psi.
3. Design: Vertical flow.
4. Body: Comply with ASTM B61 or ASTM B62, bronze.
5. End Connections: Threaded.
6. Disc (Type 1): Bronze.

2.05 BRONZE, SWING CHECK VALVES

A. General:

1. Fabricate from dezincification resistant material.
2. Copper alloys containing more than 15 percent zinc are not permitted.

2.06 BRONZE, GATE VALVES

A. General:

1. Fabricate from dezincification resistant material.
2. Copper alloys containing more than 15 percent zinc are not permitted.

2.07 IRON, GATE VALVES

2.08 LUBRICATED PLUG VALVES

A. Regular Gland with Flanged Ends:

1. Comply with MSS SP-78, Type II.
2. Class 125: CWP Rating: 200 psi.
3. Class 250: CWP Rating: 400 psi.
4. Body: ASTM A48/A48M or ASTM A126, cast iron with lubrication sealing system.
5. Pattern: Regular or short.
6. Plug: Cast iron or bronze with sealant groove.

PART 3 EXECUTION

3.01 EXAMINATION

A. Discard all packing materials and verify that valve interior, including threads and flanges are completely clean without signs of damage or degradation that could result in leakage.

B. Verify valve parts to be fully operational in all positions from closed to fully open.

C. Confirm gasket material to be suitable for the service, to be of correct size, and without defects that could compromise effectiveness.

D. Should valve is determined to be defective, replace with new valve.

3.02 INSTALLATION

A. Provide unions or flanges with valves to facilitate equipment removal and maintenance while maintaining system operation and full accessibility for servicing.

B. Provide separate valve support and locate valve with stem at or above center of piping, maintaining unimpeded stem movement.

C. Install check valves where necessary to maintain direction of flow as follows:

1. Swing Check: Install horizontal maintaining hinge pin level.

END OF SECTION

SECTION 22 0529 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

1.01 General Requirements

A. Provide required hardware to hang or support piping, equipment, or fixtures with related accessories as necessary to complete installation of plumbing work.

A. Provide hardware products listed, classified, and labeled as suitable for intended purpose.

PART 2 PRODUCTS

A. Materials for Metal Fabricated Supports: Comply with Section 05 5000.

1. Zinc-Plated Steel: Electroplated in accordance with ASTM B633 unless stated otherwise.

1. Galvanized Steel: Hot-dip galvanized in accordance with ASTM A123/A123M or ASTM A153/A153M unless stated otherwise.

A. Corrosion Resistance: Use corrosion-resistant metal-based materials fully compatible with exposed piping materials and suitable for the environment where installed.

END OF SECTION

SECTION 22 0553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates.
B. Stencils.
C. Pipe markers.

1.02 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2020.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Schedules:
    1. Submit plumbing component identification schedule listing equipment, piping, and valves.
    2. Detail proposed component identification data in terms of of wording, symbols, letter size, and color coding to be applied to corresponding product.
    3. Valve Data Format: Include id-number, location, function, and model number.
C. Product Data: Provide manufacturers catalog literature for each product required.
D. Manufacturer's Installation Instructions: Indicate special procedures, and installation.
E. Project Record Documents: Record actual locations of tagged valves.

PART 2 PRODUCTS

2.01 PLUMBING COMPONENT IDENTIFICATION GUIDELINE

A. Pipe Markers: 3/4 inch diameter and higher.

2.02 NAMEPLATES

A. Description: Laminated piece with up to three lines of text.
    1. Letter Color: White.
    2. Letter Height: 1/4 inch.
    3. Background Color: Black.

2.03 STENCILS

2.04 PIPE MARKERS

A. Comply with ASME A13.1.
B. Flexible Marker: Factory fabricated, semi-rigid, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid conveyed.
C. Flexible Tape Marker: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.
D. Identification Scheme, ASME A13.1:
    1. Primary: External Pipe Diameter, Uninsulated or Insulated.
    2. Secondary: Color scheme per fluid service.
        a. Water; Potable, Cooling, Boiler Feed, and Other: White text on green background.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive identification products.
B. Prepare surfaces for stencil painting, see Section 09 9123.

3.02 INSTALLATION

A. Install flexible nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
B. Install tags in clear view and align with axis of piping
C. Apply stencil painted identification in compliance with Section 09 9123 requirements. Identify unit with assigned id-number and area being served using pipe marking rules.
D. Install plastic pipe markers in accordance with manufacturer's instructions.
E. Install plastic tape pipe marker around pipe in accordance with manufacturer's instructions.
F. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION

SECTION 22 0719 - PLUMBING PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flexible elastomeric cellular insulation.
B. Glass fiber insulation.
C. Polyethylene insulation.
D. Jacketing and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019.
B. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2020a.
C. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2019.
D. ASTM D1056 - Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber; 2020.
E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2021.
G. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.
B. Applicator Qualifications: Company specializing in performing the type of work specified in this section and approved by manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.06 FIELD CONDITIONS

A. Maintain ambient conditions required by manufacturers of each product.
B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, UL 723, ASTM E84, or UL 723.

2.02 GLASS FIBER INSULATION

A. Insulation: ASTM C547and ASTM C795; rigid molded, noncombustible, with wicking material to transport condensed water to the outside of the system for evaporation to the atmosphere.
    1. K Value: ASTM C177, 0.23 at 75 degrees F.
    2. Maximum Service Temperature: 220 degrees F.
    3. Maximum Moisture Absorption: 0.2 percent by volume.

2.03 POLYETHYLENE INSULATION

A. Manufacturers:
    1. Armacell LLC: www.armacell.us.
    2. Substitutions: Refer to Division 01 - Product Requirements.
B. Insulation: Flexible closed-cell polyethylene tubing, slit lengthwise for installation, complying with applicable requirements of ASTM D1056.
    1. K Value: ASTM C177; 0.25 at 75 degrees F.
    2. Maximum Service Temperature: 200 degrees F.
    3. Density: 2 pcf.
    4. Maximum Moisture Absorption: 1.0 percent by volume.
    5. Moisture Vapor Permeability: 0.05 perm inch, when tested in accordance with ASTM E96/E96M.
    6. Connection: Contact adhesive.

2.04 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

A. Manufacturers:
    1. Aeroflex USA, Inc: www.aeroflexusa.com.
    2. Armacell LLC: www.armacell.us.
    3. Substitutions: Refer to Division 01 - Product Requirements.
B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 3; use molded tubular material.
    1. 'K' Value: ASTM C534; 0.25 at 75 degrees F.
    2. Minimum Service Temperature: Minus 40 degrees F.
    3. Maximum Service Temperature: 220 degrees F.
    4. Connection: Waterproof vapor barrier adhesive.
C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

2.05 JACKETING AND ACCESSORIES

A. PVC Plastic Jacket:
   1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
      a. Minimum Service Temperature: 0 degrees F.
      b. Maximum Service Temperature: 150 degrees F.
      c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
      d. Thickness: 10 mil, 0.010 inch.
      e. Connections: Brush on welding adhesive.
B. Canvas Jacket: UL listed 6 oz/sq yd plain weave cotton fabric treated with dilute fire-retardant lagging adhesive.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that piping has been tested before applying insulation materials.
B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Install in accordance with North American Insulation Manufacturers Association (NAIMA) National Insulation Standards.
C. Exposed Piping: Locate insulation with seams in least visible locations.
D. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
E. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
F. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment using preformed fitting covers.
G. Glass fiber insulated pipes conveying fluids above ambient temperature:
   1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples.
   2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
H. Inserts and Shields:
   1. Application: Piping 1-1/2 inches diameter or larger.
   2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
   3. Insert Location: Between support shield and piping and under the finish jacket.
   4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
   5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 07 8400.
J. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with canvas jacket sized for finish painting.

3.03 SCHEDULES
A. Plumbing Systems:
   1. Domestic Hot Water Supply.
      a. Glass Fiber Insulation:
         1) Pipe Size Range: All sizes.
         2) Thickness: 1 inch.
      b. Hydrous Calcium Silicate Insulation: Pipe hanger saddles.
   2. Domestic Hot Water Recirculation:
      a. Glass Fiber Insulation:
         1) Pipe Size Range: All sizes.
         2) Thickness: 1 inch.
      b. Polyethylene Insulation:
         1) Pipe Size Range: All sizes.
         2) Thickness: 1 inch.
   3. Domestic Cold Water:
      a. closed cell elastomeric or polyethylene.
      b. 1/2" thick.
   4. Roof Drain Bodies.
   5. Roof Drainage Above Grade.
   6. Roof Drainage Within 10 Feet of the Exterior:
      a. closed cell elastomeric or polyethylene.
      b. 1/2" thick.
   7. Roof Drainage Run Horizontal at Roof Level.

END OF SECTION

SECTION 22 1005 - PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sanitary waste piping, buried within 5 feet of building.
B. Sanitary waste piping, above grade.
C. Domestic water piping, buried within 5 feet of building.
D. Domestic water piping, above grade.
E. Pipe, pipe fittings, specialties, and connections for piping systems:
    1. Storm drainage piping, above grade.
    2. Natural gas piping, buried within 5 feet of building.
    3. Natural gas piping, above grade.
    4. Natural Gas Piping
    5. Pipe flanges, unions, and couplings.
    6. Pipe hangers and supports.
    7. Ball valves.
    8. Balancing valves.
    9. Pressure reducing valves.
    10. Pressure relief valves.
    11. Strainers.

1.02 REFERENCE STANDARDS

A. ANSI Z21.22 - American National Standard for Relief Valves for Hot Water Supply Systems; 2015 (Reaffirmed 2020).
B. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2016.
C. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2018.
D. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2018.
E. ASME B16.51 - Copper and Copper Alloy Press-Connect Pressure Fittings; 2021.
F. ASME B31.1 - Power Piping; 2020.
G. ASME B31.9 - Building Services Piping; 2020.
H. ASME BPVC-IV - Boiler and Pressure Vessel Code, Section IV - Rules for Construction of Heating Boilers; 2021.
I. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators; 2021.
J. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
K. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
L. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2019.
M. ASTM B32 - Standard Specification for Solder Metal; 2020.
N. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2020.
O. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2020.
P. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube; 2016.
Q. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings; 2016.
R. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.
S. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings; 2021.
T. ASTM D2239 - Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter; 2021.
U. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series); 2020.
V. ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40; 2021.
W. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020.
X. ASTM D2609 - Standard Specification for Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe; 2021.
Y. ASTM D2661 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings; 2021.
Z. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2020.
AA. ASTM D2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2021.
BB. ASTM D2846/D2846M - Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems; 2019a.
CC. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets; 2020.
DD. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2016.
EE. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
FF. ASTM F437 - Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80; 2021.

GG. ASTM F438 - Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40; 2017.
HH. ASTM F439 - Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80; 2019.
II. ASTM F441/F441M - Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80; 2020.
JJ. ASTM F442/F442M - Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR); 2020.
KK. ASTM F493 - Standard Specification for Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings; 2020.
LL. ASTM F628 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core; 2012, with Editorial Revision (2018).
MM. ASTM F876 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing; 2020b.
NN. ASTM F877 - Standard Specification for Crosslinked Polyethylene (PEX) Hot- and Cold-Water Distribution Systems; 2020.
OO. ASTM F1960 - Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing; 2021.
PP. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; 2017.
QQ. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast; 2017, with Errata (2018).
RR. AWWA C651 - Disinfecting Water Mains; 2014, with Addendum (2020).
SS. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2018.
TT. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2018.
UU. IAPMO (UPC) - Uniform Plumbing Code; 2012.
VV. IAPMO/ANSI/CAN Z1117 - Standard for Press Connections; 2022.
WW. ICC (IPC) - International Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
XX. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).
YY. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .
ZZ. NSF 61 - Drinking Water System Components - Health Effects; 2020.
AAA. NSF 372 - Drinking Water System Components - Lead Content; 2020.
BBB. PPI TR-4 - PPI Listing of Hydrostatic Design Basis (HDB), Hydrostatic Design Stress (HDS), Strength Design Basis (SDB), Pressure Design Basis (PDB), and Minimum Required Strength (MRS) Ratings For Thermoplastic Piping Materials or Pipe; 2017.
CCC. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS
A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
C. Project Record Documents: Record actual locations of valves.

1.04 QUALITY ASSURANCE
A. Perform work in accordance with applicable codes. Coordinate inspections to allow adequate time for review and approval before piping system concealment.
B. Valves: Manufacturer's name and pressure rating marked on valve body.
C. Welding Materials and Procedures: Comply with ASME BPVC-IX and applicable state labor regulations.
D. Welder Qualifications: Certified in accordance with ASME BPVC-IX.
E. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
B. Provide temporary protective coating on cast iron and steel valves.
C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.06 FIELD CONDITIONS
A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS
A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
B. Plenum-Installed Acid Waste Piping: Flame-spread index equal or below 25 and smoke-spread index equal or below 50 according to ASTM E84 or UL 723 tests.

2.02 SANITARY WASTE PIPING, BURIED WITHIN 5 FEET OF BUILDING
A. Cast Iron Pipe, Agressive Conditions, hub and spigot:
1. Pipe and Fittings: ASTM A74, Service class.

2. Tensile Strength: 21,000 psig minimum.
3. All pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute® and listed by NSF® International.
4. Each length of pipe and each fitting shall be plainly marked with size, country of origin, and name of manufacturer, or manufacturer's registered trademark by which the manufacturer can be readily identified after installation.
5. The inside of each pipe shall be reamed prior to coating to decrease the coefficient of friction.
6. Gaskets: ASTM C564 rubber.
7. Caulking Materials: ASTM B29, pure lead and oakum or hemp fiber.
8. Pipe Coating: Chemically deposited zinc-phosphate pretreatment layer followed by an electrically deposited, high-performance cathodic epoxy coating, and finally an electrically deposited, high-performance anodic epoxy top coat.
9. Fitting Coating: Chemically deposited zinc-phosphate pretreatment layer followed by an electrically deposited, high-performance cathodic epoxy coating, and finally an epoxy acrylic powder top coat.
10. Coating Performance: Pipe and Fitting Coatings must pass the following performance specifications per EN 877:
    a. 350 hours of salt spray testing
    b. Resistance to wastewater for 30 days at 73° F
    c. Chemical resistance from pH 2 to pH 12 for 30 days at 73° F
    d. Resistance to hot water for 24 hours at 203° F

B. Cast Iron Pipe, Agressive Conditions, hubless:
1. Pipe and Fittings: ASTM A 888 and CISPI 301.
2. Tensile Strength: 21,000 psig minimum.
3. All pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute® and listed by NSF® International.
4. Each length of pipe and each fitting shall be plainly marked with size, country of origin, and name of manufacturer, or manufacturer's registered trademark by which the manufacturer can be readily identified after installation.
5. The inside of each pipe shall be reamed prior to coating to decrease the coefficient of friction.
6. Couplings: Standard Duty Hubless Couplings shall conform to CISPI Standard 310, shall be manufactured in the United States, and be certified by NSF® International. Heavy Duty couplings shall conform to ASTM C 1540 and shall be manufactured in the United States.
7. Pipe Coating: Chemically deposited zinc-phosphate pretreatment layer followed by an electrically deposited, high-performance cathodic epoxy coating, and finally an electrically deposited, high performance anodic epoxy top coat.
8. Fitting Coating: Chemically deposited zinc-phosphate pretreatment layer followed by an electrically deposited, high-performance cathodic epoxy coating, and finally an epoxy acrylic powder top coat.
9. Coating Performance: Pipe and Fitting Coatings must pass the following performance specifications per EN 877:
    a. a. 350 hours of salt spray testing
    b. b. Resistance to wastewater for 30 days at 73° F
    c. c. Chemical resistance from pH 2 to pH 12 for 30 days at 73° F
    d. d. Resistance to hot water for 24 hours at 203° F

C. ABS Pipe: ASTM F628.
1. Fittings: ABS.
2. Joints: Solvent welded with ASTM D2235 cement.

D. ABS Pipe: ASTM D2661.
1. Fittings: ABS.
2. Joints: Solvent welded with ASTM D2235 cement.

E. PVC Pipe: ASTM D2665 or ASTM D3034.
1. Fittings: PVC.
2. Joints: Solvent welded, with ASTM D2564 solvent cement.

F. PVC Pipe: ASTM D2729.
1. Fittings: PVC.
2. Joints: Solvent welded, with ASTM D2564 solvent cement.

G. PVC Pipe: ASTM D2665.
1. Fittings: PVC.
2. Joints: Solvent welded, with ASTM D2564 solvent cement.

H. PVC Pipe: ASTM D1785 and ASTM D2665 dual marked Schedule 40,
1. or ASTM D2241 SDR 26 with not less than 150 psi (1 034 kPa) pressure rating.
2. Fittings: ASTM D2466, PVC.
3. Fittings: ASTM D2665, PVC.
4. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.03 SANITARY WASTE PIPING, ABOVE GRADE

A. Cast Iron Pipe: CISPI 301, hubless, service weight.
1. Fittings: Cast iron.
2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.

B. ABS Pipe: ASTM F628.

1. Fittings: ABS.
2. Joints: Solvent welded with ASTM D2235 cement.

C. ABS Pipe: ASTM D2661.
1. Fittings: ABS.
2. Joints: Solvent welded with ASTM D2235 cement.

D. PVC Pipe: ASTM D2729.
1. Fittings: PVC.
2. Joints: Solvent welded, with ASTM D2564 solvent cement.

E. PVC Pipe: ASTM D1785 and ASTM D2665 dual marked Schedule 40,
1. Fittings: ASTM D2665, PVC.
2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.04 DOMESTIC WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Ductile Iron Pipe: AWWA C151/A21.51.
1. Fittings: Ductile or gray iron, standard thickness.
2. Joints: AWWA C111/A21.11, styrene butadiene rubber (SBR) or vulcanized SBR gasket with 3/4 inch diameter rods.

B. PE Pipe: ASTM D2239.
1. Fittings: ASTM D2609, PE.
2. Joints: Mechanical with stainless steel clamp.

2.05 DOMESTIC WATER PIPING, ABOVE GRADE

A. Copper Pipe: ASTM B88 (ASTM B88M), Type K (A), Drawn (H).
1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
2. Joints: ASTM B32, alloy Sn95 solder.
3. Mechanical Press Sealed Fittings: ASME B16.51 or IAPMO/ANSI/CAN Z1117, ICC (IPC), and IAPMO (UPC) approved, NSF 61 and NSF 372 certified, with EPDM seals.
a. Manufacturers:
1) Apollo Valves: www.apollovalves.com/#sle.
2) CopperPress
3) Grinnell Products, a Tyco Business: www.grinnell.com.
4) Nibco
5) Viega LLC: www.viega.com.
6) Substitutions: See Section 01 6000 - Product Requirements.

B. CPVC Pipe (if approved by Owner and Engineer): ASTM D2846/D2846M, ASTM F441/F441M, or ASTM F442/F442M.
1. Fittings: CPVC; ASTM D2846/D2846M, ASTM F437, ASTM F438, or ASTM F439.
2. Joints: ASTM D2846/D2846M, solvent weld with ASTM F493 solvent cement.

C. Cross-Linked Polyethylene (PEX) Pipe (if approved by Owner and Engineer): ASTM F876 or ASTM F877.
1. Manufacturers:
a. SharkBite, a brand of Reliance Worldwide Corporation: www.sharkbite.com/#sle.
b. Uponor, Inc; Logic System: www.uponorengineering.com/sle.
c. Viega LLC: www.viega.com.
d. Substitutions: Refer to Division 01 - Product Requirements.
2. PPI TR-4 Pressure Design Basis:
a. 80 psig at maximum 200 degrees F.
3. Fittings: Brass and engineered polymer (EP) ASTM F1960.
4. Termination at fixtures: ASTM F1960 connection with spun-closed copper stub out through wall.
5. Joints: ASTM F1960 cold-expansion fittings (Crimp fittings are not permitted).

D. Polyethylene Raised Temp, PE-RT bimodal polyethylene (if approved by Owner and Engineer): ASTM 2769.
1. Manufacturers:
a. Legend Hyperpure
2. Rated Pressure and Temperature:
a. 200 psi at maximum 73°F
b. 100 psi at maximum 180°F
3. Fittings: Brass and engineered polymer
4. Termination at fixtures: Connection to PE-RT spun-closed copper stub out through wall.
5. Joints: Crimp, cinch, clamp, push fit, and fused fittings, per manufacturer's instruction.
6. Warranty:
a. 100-year limited warranty.

2.06 NATURAL GAS PIPING, ABOVE GRADE

A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, wrought steel welding type.
2. Joints: Threaded or welded to ASME B31.1.

2.07 PIPE FLANGES, UNIONS, AND COUPLINGS

A. Unions for Pipe Sizes 3 inch and Under:
1. Ferrous Pipe: Class 150 malleable iron threaded unions.
2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.

B. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.08 PIPE HANGERS AND SUPPORTS

A. Provide hangers and supports that comply with MSS SP-58.
   1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
   2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
   3. Trapeze Hangers: Welded steel channel frames attached to structure.
   4. Vertical Pipe Support: Steel riser clamp.
   5. Floor Supports: Concrete pier or steel pedestal with floor flange; fixture attachment.
   6. Rooftop Supports for Low-Slope Roofs: Steel pedestals with bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified; and as follows:
      a. Bases: High-density polypropylene.
      b. Base Sizes: Large enough to distribute load sufficiently to prevent indentation of roofing assembly.
      c. Steel Components: Stainless steel or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
      d. Attachment and Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion-resistant material.
      e. Height: Provide minimum clearance of 6 inches under pipe to top of roofing.

B. Plumbing Piping - Drain, Waste, and Vent:
   1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
   2. Hangers for Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
   3. Wall Support for Pipe Sizes to 3 inch: Cast iron hook.
   4. Wall Support for Pipe Sizes 4 inch and Over: Welded steel bracket and wrought steel clamp.
   5. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

C. Plumbing Piping - Water:
   1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
   2. Hangers for Cold Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
   3. Hangers for Hot Pipe Sizes 2 to 4 inch: Carbon steel, adjustable, clevis.
   4. Hangers for Hot Pipe Sizes 6 inch and Larger: Adjustable steel yoke, cast iron pipe roll, double hanger.
   5. Wall Support for Pipe Sizes Up to 3 inch: Cast iron hook.
   6. Wall Support for Pipe Sizes 4 inch and Larger: Welded steel bracket and wrought steel clamp.
   7. Wall Support for Hot Pipe Sizes 6 inch and Larger: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron pipe roll.
   8. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
   9. Floor Support for Hot Pipe Sizes to 4 inch: Cast iron adjustable pipe saddle, locknut, nipple, floor flange, and concrete pier or steel support.
   10. Floor Support for Hot Pipe Sizes 6 inch and Larger: Adjustable cast iron pipe roll and stand, steel screws, and concrete pier or steel support.
   11. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

D. Hanger Fasteners: Attach hangers to structure using appropriate fasteners.

2.09 BALL VALVES

A. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze or ductile iron body, 304 stainless steel or chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle, solder or threaded ends with union.

2.10 PRESSURE REDUCING VALVES

A. Manufacturers:
   1. Caleffi
   2. Watts Regulator Company: www.wattsregulator.com.
   3. Zurn
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. 2 inch and Smaller:
   1. ASSE 1003, bronze body, stainless steel, and thermoplastic internal parts, fabric reinforced diaphragm, strainer, threaded single union ends.
   2. Pressure Reducing Pilot-Operator:
      a. Operating Range: 5 to 50 psi.
      b. Connected into brass or bronze pilot piping and fittings.
      c. Fixed flow restrictor, pressure gauges, and isolation valves.

C. Quality Assurance:
   1. Regulate pressures to remain between 40 psi and 80 psi at all points of delivery.
   2. Do not exceed 3-6 feet per second at full flow to prevent excessive wear.
   3. Do not exceed 15 psi pressure drop at rated flow.

2.11 PRESSURE RELIEF VALVES

A. ANSI Z21.22, AGA certified, bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated.

B. Temperature and Pressure Relief Valves:
   1. Manufacturers:
      a. Watts Regulator Company: www.wattsregulator.com.

b. Substitutions: Refer to Division 01 - Product Requirements.
2. ANSI Z21.22, AGA certified, bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, temperature relief maximum 210 degrees F, capacity ASME BPVC-IV certified and labelled.

2.12 STRAINERS
A. Manufacturers:
1. Armstrong International, Inc: www.armstronginternational.com.
2. Substitutions: Refer to Division 01 - Product Requirements.
B. Size 2 inch and Smaller:
1. Threaded brass body for 175 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.
2. Class 150, threaded bronze body 300 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.
C. Size 1-1/2 inch to 4 inch:
1. Class 125, flanged iron body, Y pattern with 1/16 inch stainless steel perforated screen.

2.13 TRAP-SEAL PRIMER VALVES
A. Supply-Type, Trap-Seal Primer Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. MIFAB, Inc.
b. PPP Inc.
c. Sioux Chief Manufacturing Company, Inc.
d. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
e. Watts Industries, Inc.; Water Products Div.
2. Standard: ASSE 1018.
3. Pressure Rating: 125 psig minimum.
4. Body: Bronze.
5. Inlet and Outlet Connections: NPS 1/2 threaded, union, or solder joint.
6. Gravity Drain Outlet Connection: NPS 1/2 threaded or solder joint.
7. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

2.14 TRAP-SEAL PRIMER SYSTEMS
A. Trap-Seal Primer Systems:
1. Standard: ASSE 1044.
2. Piping: NPS 3/4, ASTM B 88, Type L; copper, water tubing.
3. Cabinet: Recessed-mounting steel box with stainless-steel cover.
4. Electric Controls: 24-hour timer, solenoid valve, and manual switch for 120-V ac power.
5. Vacuum Breaker: ASSE 1001.
6. Number Outlets: Match fixture quantity.
7. Size Outlets: NPS 1/2.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that excavations are to required grade, dry, and not over-excavated.

3.02 PREPARATION
A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
B. Remove scale and dirt, on inside and outside, before assembly.
C. Prepare piping connections to equipment with flanges or unions.

3.03 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
E. Group piping whenever practical at common elevations.
F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. See Section 22 0516.
G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
H. Provide access where valves and fittings are not exposed.
1. Coordinate size and location of access doors with Section 08 3100.
I. Establish elevations of buried piping outside the building to ensure not less than 3 ft of cover.
J. Install vent piping penetrating in roofed areas to maintain integrity of roof assembly; refer to roofing specification.
K. Where pipe supports are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
L. Provide support for utility meters in accordance with requirements of utility companies.
M. Prepare exposed, unfinished pipe, fittings, supports, and accessories for finish painting.
N. Excavate in accordance with Section 31 2316.
O. Install bell and spigot pipe with bell end upstream.
P. Install valves with stems upright or horizontal, not inverted. See Section 22 0523.
Q. Install water piping to ASME B31.9.
R. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.
S. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
T. Sleeve pipes passing through partitions, walls, and floors.

U. Inserts:
   1. Provide inserts for placement in concrete formwork.
   2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
   3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
   4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
   5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above slab.

V. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.9.
   2. Support horizontal piping as indicated.
   3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
   4. Place hangers within 12 inches of each horizontal elbow.
   5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
   6. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
   7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
   8. Provide copper plated hangers and supports for copper piping.
   9. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
      a. Painting of interior plumbing systems and components is specified in Section 09 9123.
      b. Painting of exterior plumbing systems and components is specified in Section 09 9113.
   10. Provide hangers adjacent to motor-driven equipment with vibration isolation; see Section 22 0548.
   11. Support cast iron drainage piping at every joint.

3.04 APPLICATION

A. Use grooved mechanical couplings and fasteners only in accessible locations.
B. Install unions downstream of valves and at equipment or apparatus connections.
C. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
D. Install ball or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.
E. Install globe valves for throttling, bypass, or manual flow control services.
F. Provide flow controls in water recirculating systems where indicated.
G. Provide automatic flow control valve where domestic hot water system connects to domestic hot water return system. Locate where accessible for adjustment and servicing. Set thermostatic valves for 121 degree F return temperature.
H. Provide trap-seal primer valves for all floor drains which are not collecting condensate from HVAC equipment and where noted on plan. Install with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.

3.05 TOLERANCES

A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.
B. Water Piping: Slope at minimum of 1/32 inch per foot and arrange to drain at low points.

3.06 **TESTING**

A. Pressure test piping installations according to code requirements and as follows (most stringent applies).
B. Pressure test all new, altered, extended and repaired supply, storm and sanitary drainage and vent piping.
C. Construct systems with fittings/isolation valves to allow testing of all new work.
D. Rough-in tests shall be performed with water unless manufacturer precribes alternate method.
E. Notify building inspection official before testing to allow observation / witnessing.
F. Supply rough-in test: Cap all openings and attach pressure gauge near main isolation valve. Slowly open valve filling piping with water to system pressure and vent air from top of system so entire system is filled with water at full pressure. Close isolation valve trapping water in system at pressure without makeup. Videotape entire test procedure and record pressure gauge for an additional 15 minutes showing pressure is maintained.
G. Drain and vent rough-in test: cap all openings and insert a balloon plug within existing piping or main and fill entire system to overflow. If testing is performed in sections, all sections shall include at least a 10' water column except uppermost portion of system (including venting). Videotape top of stack for 15 minutes showing level is maintained
H. Provide rough-in test report(s) to Engineer and Owner for review and comment before concealement.
I. After fixtures have been installed, operate fixtures with traps filled to confirm no visible leaks.
J. Perform final test: plug stack openings and insert manometer with at least 1" water column of air pressure. Videotape manometer showing level unchanged for at least 15 minutes and showing drop to zero upon removal of pressure.
K. Forward copies of final testing to Engineer and Owner. Maintain records and submit to building official upon request.
L. Include test reports in project closeout submittals provided to owner.

3.07 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Disinfect water distribution system in accordance with Section 33 0110.58.
B. Prior to starting work, verify system is complete, flushed, and clean.
C. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
D. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.
E. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
F. Maintain disinfectant in system for 24 hours.
G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.

H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
I. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.08 SERVICE CONNECTIONS

A. Provide new sanitary sewer services. Before commencing work, check invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.
B. Provide new water service complete with approved reduced pressure backflow preventer and water meter with by-pass valves, pressure reducing valve, and sand strainer.
    1. Provide sleeve in wall for service main and support at wall with reinforced concrete bridge. Fill enlarged sleeve with watertight, pliable , sealant. Anchor service main inside to concrete wall.

3.09 **SUPPORT SCHEDULES**

A. **Pipe Hanger Spacing**
    1. Spacing per International Plumbing Code Table 308.5 or manufacturer's instruction, whichever is more stringent.

END OF SECTION

SECTION 22 1006 - PLUMBING PIPING SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drains.
B. Cleanouts.
C. Hose bibbs.
D. Hydrants.
E. Washing machine outlet boxes.
F. Ice maker outlet boxes.
G. Backflow preventers.
H. Water hammer arrestors.
I. Sanitary waste interceptors.
J. Mixing valves.

1.02 REFERENCE STANDARDS

A. ASHRAE Std 135 - BACnet - A Data Communication Protocol for Building Automation and Control Networks; 2012.
B. ASME A112.6.3 - Floor Drains; 2022.
C. ASME A112.6.4 - Roof, Deck, and Balcony Drains; 2022.
D. ASSE 1011 - Performance Requirements for Hose Connection Vacuum Breakers; 2023.
E. ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Prevention Assemblies; 2021.
F. ASSE 1019 - Performance Requirements for Wall Hydrant with Backflow Protection and Freeze Resistance; 2023.
G. ASSE 1069 - Performance Requirements for Automatic Temperature Control Mixing Valves; 2020.
H. NSF 61 - Drinking Water System Components - Health Effects; 2020.
I. NSF 372 - Drinking Water System Components - Lead Content; 2020.
J. PDI-WH 201 - Water Hammer Arresters; 2017.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
C. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.
D. Certificates: Certify that all interceptors meet or exceed capacity and flow rate scheduled on plans.
E. Sustainable Design Documentation: Submit appropriate evidence that materials used in potable water systems comply with the specified requirements.
F. Operation Data: Indicate frequency of treatment required for interceptors.
G. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
H. Project Record Documents: Record actual locations of equipment, cleanouts, backflow preventers, water hammer arrestors.
I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. Refer to Division 01 - Product Requirements, for additional provisions.
    2. Extra Loose Keys for Outside Hose Bibbs: One.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Accept specialties on site in original factory packaging. Inspect for damage.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.
B. Unless otherwise noted on plans, provide fixtures as specified below.

2.02 DRAINS

A. Manufacturers:
    1. Jay R. Smith Manufacturing Company: www.jayrsmith.com.
    2. Josam Company: www.josam.com.
    3. Zurn Industries, LLC: www.zurn.com.
    4. Substitutions: Refer to Division 01 - Product Requirements.
B. Roof Drains:
    1. Assembly: ASME A112.6.4.
    2. Body: Lacquered cast iron with sump.
    3. Strainer: Removable cast aluminum or cast iron dome with vandal proof screws.
    4. Accessories: Coordinate with roofing type, refer to Division 07:
        a. Membrane flange and membrane clamp with integral gravel stop.
        b. Adjustable under deck clamp.
        c. Waterproofing flange.
        d. Controlled flow weir.
        e. Leveling frame.
        f. Adjustable extension sleeve for roof insulation.
        g. Perforated or slotted ballast guard extension for inverted roof.
        h. Perforated stainless steel ballast guard extension.
C. Roof Overflow Drains:

1. Lacquered cast iron body and clamp collar and bottom clamp ring; pipe extended to 2 inches above flood elevation.

D. Downspout Nozzles:
1. Bronze round with straight bottom section.

E. Floor Drain (FD-1):
1. ASME A112.6.3; lacquered cast iron or stainless steel, two piece body with double drainage flange, weep holes, reversible clamping collar, and round, adjustable nickel-bronze strainer.

2.03 CLEANOUTS

A. Manufacturers:
1. Substitutions: Refer to Division 01 - Product Requirements.

B. Cleanouts at Exterior Surfaced Areas (CO-1):
1. Round cast nickel bronze access frame and non-skid cover.

C. Cleanouts at Exterior Unsurfaced Areas (CO-2):
1. Line type with lacquered cast iron body and round epoxy coated gasketed cover.

D. Cleanouts at Interior Finished Floor Areas (CO-3):
1. Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.

E. Cleanouts at Interior Finished Wall Areas (CO-4):
1. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.

F. Cleanouts at Interior Unfinished Accessible Areas (CO-5): Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

2.04 HOSE BIBBS

A. Manufacturers:
1. Woodford.
2. Jay R. Smith Manufacturing Company: www.jayrsmith.com.
3. Watts Regulator Company: www.wattsregulator.com.
4. Zurn Industries, Inc: www.zurn.com.
5. Substitutions: Refer to Division 01 - Product Requirements.

B. Exterior Hose Bibbs:
1. ASSE 1019; freeze resistant, self-draining type with chrome plated wall plate, hose thread spout, and integral vacuum breaker.
2. Provide with key/removeable handle and furnish to owner at substantial completion.

C. Interior Hose Bibbs:
1. Bronze or brass with mounting flange, replaceable seat, hose thread spout, and integral or add-on vacuum breaker complying with ASSE 1011.

2.05 HYDRANTS

A. Manufacturers:
1. Woodford.
2. Arrowhead Brass & Plumbing, LLC: www.arrowheadbrass.com.
3. Jay R. Smith Manufacturing Company: www.jayrsmith.com.
4. Zurn Industries, LLC: www.zurn.com.
5. Watts Regulator Company: www.wattsregulator.com.
6. Substitutions: Refer to Division 01 - Product Requirements.

B. Wall Hydrants:
1. ASSE 1019; freeze resistant, self-draining type with chrome plated wall plate hose thread spout, lockshield and removable key, and integral vacuum breaker.

C. Roof Hydrants:
1. ASSE 1019 freeze resistant, self draining type with chrome plated base plate, standpipe hose thread spout, lockshield and removable key, and integral vacuum breaker.

2.06 WASHING MACHINE OUTLET BOXES

A. Box Manufacturers:
1. IPS Corporation/Guy Grey: www.ipscorp.com.
2. Oatey: www.oatey.com.
3. Substitutions: Refer to Division 01 - Product Requirements.

B. Description: Preformed rough-in box with brass valves with single lever handle, socket for 2 inch waste, slip in finishing cover.

2.07 ICE MAKER OUTLET BOXES

A. Box Manufacturers:
1. IPS Corporation/Water-Tite: www.ipscorp.com.
2. Oatey Supply Chain Services, Inc: www.oatey.com.
3. Substitutions: Refer to Division 01 - Product Requirements.

B. Description: Plastic preformed square or round rough-in box with brass quarter-turn ball valve, and slip-in finishing cover.

2.08 BACKFLOW PREVENTERS

A. Manufacturers:
1. Watts Regulator Company: www.wattsregulator.com.

2. Zurn Industries, Inc: www.zurn.com.

B. Reduced Pressure Backflow Preventer Assembly:

1. ASSE 1013; cast bronze body and stainless steel springs; two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve that opens under back pressure in case of diaphragm failure, and non-threaded vent outlet.
2. Size: 3/4 to 2 inch assembly with threaded gate valves.

2.09 WATER HAMMER ARRESTORS

A. Manufacturers:

1. Jay R. Smith Manufacturing Company: www.jayrsmith.com.
2. Watts Regulator Company, a part of Watts Water Technologies: www.wattsregulator.com.
3. Zurn Industries, LLC: www.zurn.com.
4. Substitutions: Refer to Division 01 - Product Requirements.

B. Water Hammer Arrestors:

1. Stainless steel construction, bellows type sized in accordance with PDI-WH 201, precharged suitable for operation in temperature range minus 100 to 300 degrees F and maximum 250 psi working pressure.

2.10 SANITARY WASTE INTERCEPTORS

A. Manufacturers:

1. Zurn Industries, LLC: www.zurn.com.
2. Substitutions: Refer to Division 01 - Product Requirements.

B. Grease Interceptors:

1. Construction:
   a. Material: Precast concrete.
   b. Rough-in: Fully recessed below grade (deep rough-in), with grade rings and gravel base.
   c. Accessories: Multi-weir baffle assembly, integral deep seal trap, removable integral flow control, sediment bucket.
   d. Cover: Steel, epoxy coated, non-skid with gasket, securing handle, and enzyme injection port, recessed for floor finish.
2. Unit Rating: gpm flow and lbs grease capacity per plans and local requirements (most stringent).

C. Lint/Sand/Sediment Interceptors:

1. Epoxy coated cast iron body and secured cover with removable stainless steel sediment bucket.

2.11 Mixing Valves

A. Automatic Temperature Control Mixing Valves:

1. Manufacturers:
   a. Armstrong (Brain Digital Mixing Station).
   b. Caleffi (6000 Legiomix)
   c. Powers (Digital IntelliStation).
   d. Aerco (Digital Mixing Station)
   e. Substitutions: See Section 01 6000 - Product Requirements.
2. Valve: ASSE 1069, bronze or brass body; thermostatic element; corrosion- and lime-resistant internal components; integral locking temperature adjustment; integral check valves with strainer screens on inlets.
3. Capacity: as scheduled on plans
4. Accessories:
   a. Shut-off valve on outlet.
   b. Stem thermometer on outlet.

B. Thermostatic Tempering Valves:

1. Manufacturers:
   a. Watts.
   b. Zurn
   c. Caleffi
   d. Substitutions: Refer to Division 01 - Product Requirements.
2. Valve: lead free brass body, stainless steel or copper alloy bellows, integral temperature adjustment.
3. Accessories:
   a. Check valve with strainer on inlets.
   b. Volume control shut-off valve on outlet.
4. ASSE 1070

C. Thermostatic Balance Valves:

1. Manufacturers:
   a. Bell & Gossett Temp Setter
   b. Caleffi Thermosetter 116 series.
   c. Thermomegatech Circuit Solver
2. Valve: Lead free brass body, stainless steel springs and cartridge, integral temperature adjustment from 95 to 140 degrees F with locking adjustment knob.
   a. Capacity: 2 gpm flow at 1 psi pressure drop at full open.
   b. Cv: 2.1 maximum, .23 minimum, .52 design.
3. Accessories:
   a. An integral dry-well holds a slide-in temperature gauge for local indication, or a sensor for remote temperature sensing.
   b. Integral check valve to protect against circuit thermo-syphoning.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that walls and/or floors are prepared and ready for installation.
B. Confirm that structure is constructed with adequate support.
C. Confirm connecting pipe size exceeds minimum requirements.

3.02 PREPARATION

A. Provide additional blocking to structure to prevent movement after construction.
B. Confirm location and size of openings before rough-in and installation.

3.03 INSTALLATION

A. Install all work in accordance with manufacturer's instructions.
B. Install components level and plumb.
C. Install and secure work in place with flanges, screws, and bolts.
D. Seal to waterproofing membranes with sealant meeting membrane requirements.
E. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
F. Encase exterior cleanouts in concrete flush with grade.
G. Install floor cleanouts and floor drains at elevation to accommodate finished floor.
H. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibbs.
I. Pipe relief from backflow preventer to nearest drain.
J. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to washing machine outlets.

END OF SECTION

SECTION 22 1119 - DOMESTIC WATER PIPING SPECIALTIES

PART 2 PRODUCTS

1.01 General Requirements

A. Specialties in Potable Water Supply Systems: Provide products complying with NSF 61 and NSF 372.

B. Source Limitations: Furnish domestic water piping specialties of same kind by same manufacturer.

C. Provide brass-bodied domestic water piping specialties in DZR brass.

END OF SECTION

PART 3 EXECUTION

1.01 EXAMINATION

A. Verify that excavations are to required grade, dry, and not over-excavated.

1.02 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
B. Remove scale and dirt, on inside and outside, before assembly.
C. Prepare piping connections to equipment with flanges or unions.

1.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
E. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
F. Provide access where valves and fittings are not exposed.
    1. Coordinate size and location of access doors with Section 08 3100.
G. Provide support for utility meters in accordance with requirements of utility companies.

1.04 APPLICATION

A. Install unions downstream of valves and at equipment or apparatus connections.
B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
C. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
D. Install ball valves for throttling, bypass, or manual flow control services.
E. Provide plug valves in natural gas systems for shut-off service.

1.05 SERVICE CONNECTIONS

A. Provide new gas service complete with gas meter and regulators in accordance with Section 33 5216. Gas service distribution piping to have initial minimum pressure of 7 inch wg. Provide regulators on each line serving gravity type appliances, sized in accordance with equipment.

1.06 SCHEDULES

A. Pipe Hanger Spacing:
    1. Metal Piping:
        a. Pipe Size: 1/2 inches to 1-1/4 inches:
            1) Maximum Hanger Spacing: 6.5 ft.
            2) Hanger Rod Diameter: 3/8 inches.
        b. Pipe Size: 1-1/2 inches to 2 inches:
            1) Maximum Hanger Spacing: 10 ft.
            2) Hanger Rod Diameter: 3/8 inch.
        c. Pipe Size: 2-1/2 inches to 3 inches:
            1) Maximum Hanger Spacing: 10 ft.
            2) Hanger Rod Diameter: 1/2 inch.
        d. Pipe Size: 4 inches to 6 inches:
            1) Maximum Hanger Spacing: 10 ft.
            2) Hanger Rod Diameter: 5/8 inch.

END OF SECTION

PART 2 PRODUCTS

END OF SECTION

SECTION 22 1423 - STORM DRAINAGE PIPING SPECIALTIES

PART 2 PRODUCTS

1.01 General Requirements

A. Plastic Storm Drainage Piping Specialties: Provide plastic products complying with NSF 14.

B. Source Limitations: Furnish drains and storm drainage piping specialties of same kind by same manufacturer.

END OF SECTION

PART 2 PRODUCTS

END OF SECTION

SECTION 22 3000 - PLUMBING EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Residential gas-fired water heaters.
B. Commercial gas-fired water heaters.
C. Residential electric water heaters.
D. Diaphragm-type compression tanks.
E. In-line circulator pumps.

1.02 REFERENCE STANDARDS

A. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
B. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels; 2021.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by affected installers.
B. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittals procedures.
B. Product Data:
    1. Product Data: Provide manufacturer's literature and data sheets for each product. Include information on materials of fabrication, assembly of components, dimensions, weights, capabilities, performance, electrical characteristics, location and sizes of connections, service and access locations, and manufacturer-provided and field-installed accessories.
C. Operation and Maintenance Data: Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.
D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

1.06 DELIVERY, STORAGE, AND HANDLING

A. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.07 WARRANTY

A. Refer to Division 01 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 WATER HEATERS

A. Residential Gas-Fired Water Heaters:
    1. Type: Automatic, natural gas-fired, vertical storage.
    2. Minimum Efficiency Required: ASHRAE Std 90.1 I-P.
    3. Performance:
    4. Tank: Glass lined welded steel with single flue passage, flue baffle and draft hood; thermally insulated and encased in corrosion-resistant steel jacket; baked-on enamel finish; floor shield and legs.
    5. All internal surfaces of the tank exposed to water shall be glass-lined with Vitraglas® vitreous enamel with Microban® antimicrobial technology that has been fused to steel by firing at a temperature range of 1,600°F.
    6. Controls: Automatic water thermostat and built-in gas pressure regulator; temperature range adjustable from 120 to 170 degrees F, cast iron or sheet metal burner, safety pilot and thermocouple.
    7. Accessories:
        a. Water Connections: Brass.
        b. Dip Tube: Brass.
        c. Drain valve.
        d. Anode: Magnesium.
B. Commercial Gas-Fired Water Heaters:
    1. Type: Automatic, natural gas-fired, vertical storage.
    2. Minimum Efficiency Required: ASHRAE Std 90.1 I-P.
    3. Performance:
    4. Accessories:
        a. Water Connections: Brass.
        b. Dip Tube: Brass.
        c. Drain valve.
        d. Anode: Magnesium.
        e. Temperature and Pressure Relief Valve: ASME labeled.
    5. Applications:
        a. Automatic storage water heater.
        b. Automatic circulating tank water heater.
        c. For operation at 180 degrees F.
        d. For operation on combustible floors.
    6. Controls: Automatic water thermostat with temperature range adjustable from 120 to 180 degrees F, automatic reset high temperature limiting thermostat factory set at 195 degrees F, gas pressure regulator, multi-ribbon or tubular burner, 100 percent safety shut-off pilot and thermocouple, flue baffle and draft hood.

C. Residential Electric Water Heaters:
1. Type: Automatic, electric, vertical storage.
2. Minimum Efficiency Required: ASHRAE Std 90.1 I-P.
3. Performance:
a. As scheduled on plans.
4. Electrical Characteristics:
a. As scheduled on plans.
5. Tank: Glass lined welded steel, thermally insulated with one inch thick glass fiber; encased in corrosion-resistant steel jacket; baked-on enamel finish.
6. Controls: Automatic water thermostat with externally adjustable temperature range from 120 to 170 degrees F, flanged or screw-in nichrome elements, enclosed controls and electrical junction box and operating light. Wire double element units so elements do not operate simultaneously.
7. Accessories:
a. Water Connections: Brass.
b. Dip Tube: Brass.
c. Drain valve.
d. Anode: Magnesium.
e. Temperature and Pressure Relief Valve: ASME labeled.

2.02 WATER HEATER MANUFACTURERS
A. A.O. Smith Water Products Co: www.hotwater.com.
B. Bradford White Water Heaters
C. State Water Heaters
D. Lochinvar Water Heaters

2.03 DIAPHRAGM-TYPE COMPRESSION TANKS
A. Construction: Welded steel, tested and stamped in accordance with ASME BPVC-VIII-1; supplied with National Board Form U-1, rated for working pressure of 125 psig, with flexible EPDM diaphragm sealed into tank, and steel legs or saddles.
B. Accessories: Pressure gauge and air-charging fitting, tank drain; precharge to 12 psig.

2.04 IN-LINE CIRCULATOR PUMPS
A. Manufacturers:
1. Armstrong Pumps Inc: www.armstrongpumps.com.
2. ITT Bell & Gossett: www.bellgossett.com.
3. Grundfos
4. Substitutions: Refer to Division 01 - Product Requirements.
B. Casing: Bronze, rated for 125 psig working pressure, with stainless steel rotor assembly.
C. Impeller: Bronze.
D. Shaft: Alloy steel with integral thrust collar and two oil lubricated bronze sleeve bearings.
E. Seal: Carbon rotating against a stationary ceramic seat.
F. Drive: Flexible coupling.

2.05 SUBMERSIBLE SUMP PUMPS
A. Manufacturers:
1. Armstrong Pumps Inc: www.armstrongpumps.com.
2. Goulds Pumps: www.goulds.com.
3. Zoeller Pump Company: www.zoeller.com.
4. Substitutions: Refer to Division 01 - Product Requirements.
B. Type: Completely submersible, vertical, centrifugal.
C. Casing: Cast iron pump body and oil filled motor chamber.
D. Impeller: Cast iron; open non-clog, stainless steel shaft.
E. Bearings: Ball bearings.
F. Sump: Fiberglass basin with steel cover plate; 24 inches diameter, 48 inches deep.
G. Accessories: Oil resistant 6 foot cord and plug with three-prong connector for connection to electric wiring system including grounding connector.
H. Servicing: Slide-away coupling consisting of discharge elbow secure to sump floor, movable bracket, guide pipe system, lifting chain and chain hooks.
I. Controls: Integral diaphragm type level controls with separate liquid level control high level alarm.

PART 3 EXECUTION

3.01 INSTALLATION
A. Coordinate system, equipment, and piping work with applicable electrical, fuel, gas, vent, drain, and waste support interconnections as included or provided by other trades.
B. Domestic Hot Water Storage Tanks:
1. Provide steel pipe support, independent of building structural framing members.
2. Clean and flush prior to delivery to site. Seal until pipe connections are made.
C. Pumps:
1. Ensure shaft length allows sump pumps to be located minimum 24 inches below lowest invert into sump pit and minimum 6 inches clearance from bottom of sump pit.
2. Provide air cock and drain connection on horizontal pump casings.
3. Provide line sized isolating valve and strainer on suction and line sized soft seated check valve and balancing valve on discharge.

4. Decrease from line size with long radius reducing elbows or reducers. Support piping adjacent to pump such that no weight is carried on pump casings. Provide supports under elbows on pump suction and discharge line sizes 4 inches and over.
5. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.
6. Align and verify alignment of base mounted pumps prior to start-up.
7. Provide electrical interlocking from cooling condensate pump safety switch to associated HVAC unit(s) furnished under other Sections.

END OF SECTION

SECTION 22 4000 - PLUMBING FIXTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush valve water closets.
B. Tank type water closets.
C. Wall hung urinals.
D. Lavatories.
E. Sinks.
F. Under-lavatory pipe supply covers.
G. Bathtubs and showers.
H. Shower receptors.
I. Showers.
J. Electric water coolers.
K. Bi-level, electric water coolers.
L. Service sinks.

1.02 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
B. ASHRAE Std 18 - Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration; 2008 (Reaffirmed 2013).
C. ASME A112.6.1M - Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use; 1997 (Reaffirmed 2017).
D. ASME A112.18.1 - Plumbing Supply Fittings; 2024.
E. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011 (Reaffirmed 2017).
F. ASME A112.19.2 - Ceramic Plumbing Fixtures; 2018, with Errata.
G. ASME A112.19.5 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks; 2017.
H. ASSE 1014 - Performance Requirements for Backflow Prevention Devices for Hand-Held Showers; 2020.
I. ASSE 1070 - Performance Requirements for Water Temperature Limiting Devices; 2020.
J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
K. IAPMO Z124 - Plastic Plumbing Fixtures; 2022, with Editorial Revision.
L. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
M. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.
N. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
O. NSF 61 - Drinking Water System Components - Health Effects; 2020.
P. NSF 372 - Drinking Water System Components - Lead Content; 2020.
Q. UL (DIR) - Online Certifications Directory; Current Edition.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
C. Samples: Submit two lavatory supply fittings.
D. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. Refer to Division 01 - Product Requirements, for additional provisions.
    2. Extra Faucet Washers: One set of each type and size.
    3. Extra Shower Heads: One of each type and size.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.05 MOCK-UP

A. Provide mock-up of typical bathroom group.
B. Mock-up may remain as part of the Work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept fixtures on-site in factory packaging. Inspect for damage.
B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.07 WARRANTY

A. Refer to Division 01 - Closeout Submittals, for additional warranty requirements.
B. Provide five year manufacturer warranty for electric water cooler.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
B. Water Efficiency: EPA WaterSense label is required for all water closets, urinals, lavatory faucets, and showerheads.

2.02 REGULATORY REQUIREMENTS

A. Comply with applicable codes for installation of plumbing systems.
B. Comply with UL (DIR) requirements.

C. Perform work in accordance with local health department regulations.
D. Provide certificate of compliance from Authority Having Jurisdiction indicating approval of installation.

2.03 TANK TYPE WATER CLOSETS

A. Manufacturers:
1. American Standard, Inc: www.americanstandard-us.com.
2. Kohler Company: www.kohler.com.
3. Niagara Corp. www.niagaracorp.com.
4. Substitutions: Refer to Division 01 - Product Requirements.

B. Water consumption: As scheduled on plans.
C. Performance: MaP score >1000 gram solids capacity.
D. Seat Manufacturers:
1. American Standard, Inc: www.americanstandard-us.com.
2. Bemis Manufacturing Company: www.bemismfg.com.
3. Church Seat Company: www.churchseats.com.
4. Olsonite: www.olsonite.com.
5. Substitutions: Refer to Division 01 - Product Requirements.

2.04 WALL HUNG URINALS

A. Vitreous china, ASME A112.19.2, wall hung with side shields and concealed carrier.
1. Consumption: as scheduled on plans.
2. Flush Valve: Exposed (top spud).
3. Flush Operation: Sensor operated.
4. Trapway Outlet: Integral.

B. Flush Valves:
1. Manufacturers:
a. American Standard, Inc: www.americanstandard-us.com/#sle.
b. Sloan Valve Company: www.sloanvalve.com/#sle.
c. Zurn Industries, LLC; ZEMS Series: www.zurn.com/#sle.
d. Substitutions: Refer to Division 01 - Product Requirements.
2. Sensor-Operated:
a. Type: ASME A112.19.5; chloramine-resistant, clog-resistant dual-seat diaphragm valve with vacuum breaker, stops and accessories.
b. Mechanism: Solenoid-operated piston or electronic motor-actuated operator with low-voltage powered infrared sensor, and mechanical override or override push button.
c. Supplied Volume Capacity: 1.2 gal per flush.
3. Exposed Type: Chrome-plated, escutcheon, integral screwdriver stop.
4. Metering Type: Easily accessible adjustment nut.

C. Urinal Carriers:
1. ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing studs.

2.05 LAVATORIES

A. Manufacturers:
1. American Standard, Inc: www.americanstandard-us.com.
2. Kohler Company: www.kohler.com.
3. Toto USA: www.totousa.com.
4. Substitutions: Refer to Division 01 - Product Requirements.

B. Vitreous China Counter Top Basin: ASME A112.19.2; vitreous china self-rimming counter top lavatory, with drillings to match faucet, front overflow, soap depression, seal with concealed vinyl gasket and caulk.

C. Supply Faucet Manufacturers:
1. American Standard, Inc: www.americanstandard-us.com.
2. Kohler Company: www.kohler.com.
3. Substitutions: Refer to Division 01 - Product Requirements.

2.06 SINKS

A. Single Compartment Bowl: ASME A112.19.3;
1. 20 gage, 0.0359 inch thick, Type 302 stainless steel, self rimming and undercoated, with ledge back drilled for trim.
2. Drain: 3-1/2 inch crumb cup and tailpiece.

B. Double Compartment Bowl: ASME A112.19.1, 20"w by 30" by 6.5" deep, 20 gauge Type 302 stainless steel, self rimming, undercoated exterior with rear drain punch to meet ADA clearance, and rear ledge drilled for trim.
1. Drain: 3-1/2 inch crumb cup and 1-1/2 inch tailpiece.

2.07 UNDER-LAVATORY PIPE SUPPLY COVERS

A. General:
1. Insulate exposed drainage piping including hot, cold and tempered water supplies under lavatories or sinks per ADA Standards.
2. Construction: 1/8 inch PVC with antimicrobial, antifungal and UV resistant properties.
a. Comply with ASME A112.18.9 for covers on accessible lavatory piping.
b. Comply with ICC A117.1.

2.08 BATHTUBS

A. Manufacturers:

1. American Standard, Inc: www.americanstandard-us.com/#sle.
2. Kohler Company: www.kohler.com.
3. Substitutions: See Section 01 6000 - Product Requirements.

B. Bathtub:
1. IAPMO Z124; molded glass fiber reinforced polyester, with slip-resistant bottom surface, contoured shape, color as selected by architect.
2. Length: 60 inches.
3. Width: 30 inches.

C. Bath Trim: ASME A112.18.1; concealed over rim supply with spout, lever operated pop-up waste and overflow, pressure balanced mixing valve, and hand held shower head.

D. Hand-Held Shower Head:
1. ASME A112.18.1, adjustable spray hand-held shower head with swivel fitting with ASSE 1014 backflow preventer.
2. Provide pushbutton flow control.
3. Include 60 inch minimum flexible polished stainless steel hose and in-line vacuum breaker
4. Provide wall bracket to mount hand spray, allowing use of the unit as either a hand-held spray or a fixed shower head.
5. Provide 36" combination glide bar/grab bar with sliding spray holder that locks at any height, allowing use of unit as either a hand-held spray or a fixed shower head.

2.09 SHOWER RECEPTORS

A. Solid Surfacing Shower Receptors: Solid plastic resin casting, self-supporting, for installation over conventional subfloor; complying with IAPMO Z124.
1. Material: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, renewable material filler, and pigments; homogenous, nonporous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
2. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 450 or less, Class A, when tested in accordance with ASTM E84.
3. Finish on Exposed Surfaces: Provide satin or matte, gloss rating of 3 to 20.

B. Drain Trim: Removable chrome-plated strainer and tail piece.

2.10 SHOWERS

A. Shower Trim:
1. Single Handle: ASME A112.18.1; lever-handle operated, pressure balanced mixing valve with integral service stops, bent shower arm with adjustable spray ball joint shower head with maximum flow, and escutcheon.

B. Hand-Held Shower Head:
1. ASME A112.18.1, adjustable spray hand-held shower head with swivel fitting with ASSE 1014 backflow preventer.
2. Provide pushbutton flow control.
3. Include 60 inch minimum flexible polished stainless steel hose and in-line vacuum breaker
4. Provide 36" combination glide bar/grab bar with sliding spray holder that locks at any height, allowing use of unit as either a hand-held spray or a fixed shower head.

2.11 ELECTRIC WATER COOLERS

A. Manufacturers:
1. Sunroc Division of Oasis: http://www.sunroccoolers.com.
2. Elkay Manufacturing Company: www.elkay.com.
3. Haws Corporation: www.hawsco.com.
4. Oasis, a Lynn Tilton Company: www.oasiscoolers.com.
5. Substitutions: Refer to Division 01 - Product Requirements.

B. Water Cooler: Electric, mechanically refrigerated; surface mounted, ADA compliant; stainless steel top, vinyl on steel body, elevated anti-squirt bubbler with stream guard, automatic stream regulator, push button, mounting bracket; integral air cooled condenser and stainless steel grille.
1. Capacity: 8 gph of 50 degrees F water with inlet at 80 degrees F and room temperature of 90 degrees F, when tested in accordance with ASHRAE Std 18.
2. Electrical: 115 VAC, 60 Hertz compressor, 6 foot cord and plug for connection to electric wiring system including grounding connector.

2.12 SERVICE SINKS

A. Manufacturers:
1. Elkay Manufacturing Company: www.elkay.com.
2. Fiat: www.fiat.com.
3. Substitutions: Refer to Division 01 - Product Requirements.

B. Bowl: 36 by 24 by 10 inches high, white molded stone, floor mounted, with 1-inch wide shoulders, vinyl bumper guard, stainless steel strainer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

3.02 PREPARATION

A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.03 INSTALLATION

A. Install each fixture with trap, easily removable for servicing and cleaning.
B. Provide chrome-plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
C. Install components level and plumb.
D. Install and secure fixtures in place with wall supports and bolts.
E. Seal fixtures to wall and floor surfaces with sealant as specified in Section 07 9005, color to match fixture.

3.04 INTERFACE WITH WORK OF OTHER SECTIONS

A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.05 ADJUSTING

A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.06 CLEANING

A. Clean plumbing fixtures and equipment before substantial completion.

3.07 PROTECTION

A. Protect installed products from damage due to subsequent construction operations.
B. Do not permit use of fixtures by construction personnel.
C. Repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 22 4017 - BATHTUBS AND SHOWERS

PART 2 PRODUCTS

1.01 General Requirements

A. Potable Water Systems: Provide supply fixtures, fittings, valves, and trim certified as complying with NSF 61 and NSF 372.

B. ADA: Where indicated to be ADA-compliant, provide fixtures complying with ADA Standards and ICC A117.1.

C. Maximum Fixture and Faucet Supply Pressure: 80 psi unless stated otherwise.

END OF SECTION

SECTION 23 0050 - HVAC EXECUTION

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes:
   1. Definitions.
   2. Coordination.
   3. Piping materials and installation instructions common to most piping systems.
   4. Dielectric fittings.
   5. Mechanical sleeve seals.
   6. Sleeves.
   7. Escutcheons.
   8. Grout.
   9. HVAC demolition.
   10. Equipment installation requirements common to equipment sections.
   11. Concrete bases.
   12. Supports and anchorages.

1.02 RELATED DOCUMENTS

A. Drawings, General Provisions of the Contract, including General Conditions, Supplementary General Conditions, other Division 00 & 01 Specification Sections, shall apply to this division.

B. These requirements apply to all Division 23 work.

1.03 DEFINITIONS

A. "Approved" means approved by the Engineer and Owner.

B. "Furnish" means to purchase, arrange for delivery to site, and to take delivery at the site.

C. "Install" means to place in position for use.

D. "Provide" means to furnish and install.

E. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.

F. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

G. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

H. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

I. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

1.04 COORDINATION

A. Coordination: Coordinate construction operations to ensure efficient and orderly installation of the Work.
   1. Coordinate construction operations, which depend on each other for proper installation, connection, and operation.
   2. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   3. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
   4. Make adequate provisions to accommodate items scheduled for later installation.
   5. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Construction Schedule.
   2. Preparation of the Schedule of Values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Pre-installation conferences.
   7. Project closeout activities.
   8. Startup and adjustment of systems.
   9. Project closeout activities.

1.05 PROJECT MEETINGS

A. General: Attend meetings and conferences at Project site, unless otherwise indicated.
   1. Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Engineer of scheduled meeting dates and times.
   2. Agenda: Request the meeting agenda if not furnished prior to meeting.

3. Minutes: Record significant discussions and agreements achieved. Request the meeting minutes if not furnished. Note all discrepancies and notify Engineer of all changes to the Work or to the Contract Documents.

B. Preconstruction Conference: Attend the preconstruction conference before starting construction, no later than 15 days after execution of the Agreement to review responsibilities and personnel assignments.
   1. Attendees: Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: Discuss items of significance that could affect progress, including the following as applicable:
      a. Tentative construction schedule.
      b. Phasing.
      c. Critical work sequencing and long-lead items.
      d. Designation of key personnel and their duties.
      e. Procedures for processing field decisions and Change Orders.
      f. Procedures for requests for interpretations (RFIs).
      g. Procedures for testing and inspecting.
      h. Procedures for processing Applications for Payment.
      i. Distribution of the Contract Documents.
      j. Submittal procedures.
      k. LEED requirements.
      l. Preparation of Record Documents.
      m. Use of the premises.
      n. Work restrictions.
      o. Owner's occupancy requirements.
      p. Responsibility for temporary facilities and controls.
      q. Construction waste management and recycling.
      r. Parking availability.
      s. Office, work, and storage areas.
      t. Equipment deliveries and priorities.
      u. First aid.
      v. Security.
      w. Progress cleaning.
      x. Working hours.

C. Pre-installation Conferences: Attend a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
   1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
   2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following as applicable:
      a. The Contract Documents.
      b. Options.
      c. Related requests for interpretations (RFIs).
      d. Related Change Orders.
      e. Purchases, deliveries, submittals.
      f. Review of mockups.
      g. Possible conflicts.
      h. Compatibility problems.
      i. Time schedules.
      j. Weather limitations.
      k. Manufacturer's written recommendations.
      l. Warranty requirements.
      m. Compatibility of materials.
      n. Acceptability of substrates.
      o. Space and access limitations.
      p. Regulations of authorities having jurisdiction.
      q. Testing and inspecting requirements.
      r. Installation procedures.
      s. Coordination with other work.
      t. Required performance results.
      u. Protection of adjacent work.
      v. Protection of construction and personnel.
   3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
   4. Reporting: Distribute minutes of the meeting to each party present, to parties who should have been present, and to the Engineer.
   5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

1.06 SUBMITTALS

A. Alternate Products: Alternate manufacturers, equipment and /or products must be specified or approved prior to bid in writing via addendum to be accepted. All costs associated with deviations from the basis of design shall be borne by the contractor. Deviations shall include alternate manufacturer and/or alternate product and shall include all significant dimensional, performance, electrical, or installation differences from the basis of design products. Costs for reimbursement shall include the costs of other trades affected, and shall include all engineering costs to evaluate such deviations.

B. Substitutions: Unspecified manufacturers shall be considered substitutions and shall be submitted for consideration under the specified substitution procedures. Substitutions shall be submitted to the engineer for evaluation. If approved by the engineer, substitution shall be offered to the owner for consideration. All costs associated with substitutions shall be borne by the contractor. Costs for reimbursement shall include the costs of other trades affected, and shall include all engineering costs to evaluate such deviations.

C. Coordination Drawings: Prepare Coordination Drawings (coordinated shop drawings), scaled at not less than 3/8”=1’-0”, to coordinate and maximize utilization of space for efficient installation of different components and for installation of products and materials fabricated by separate entities. Submit to Engineer for review before starting work.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:

a. Indicate functional and spatial relationships of components of the work with all other systems and trades.

b. Indicate required installation sequences.

c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide sketches of proposed alternate construction to Engineer for resolution of such conflicts. Dimension changes and difficult installations will not be considered changes to the Contract.

D. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project. Submit to Engineer before starting work.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

E. Make all necessary field measurements and investigations to assure that the equipment and assemblies will meet contract requirements. If equipment is submitted which differs in arrangement from that shown, provide drawings that show the rearrangement of all associated systems. Approval will be given only if all features of the equipment and associated systems, including accessibility, are equivalent to that required by the contract.

F. Prior to submitting shop drawings for review, contractor shall certify in writing that manufacturers of all major items of equipment have each reviewed drawings and specifications, and have jointly coordinated and properly integrated their equipment and controls to provide a complete and efficient installation.

G. Welding certificates.

1.07 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."

2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Electrical Characteristics for HVAC Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified at contractor’s cost. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

1.08 Warranties

A. All work shall include a parts and labor warranty on materials and workmanship for a period of 1 year. In addition to standard manufacturer product warranties, all equipment shall include a warranty on compressors and heat exchangers for a period of 10 years.

B. Refer to Division 01 for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURED CURBS

A. Manufactured Curbs, Equipment Rails, and Other Roof Mounting Assemblies:

1. The Pate Company: www.patecurbs.com.

2. Substitutions: Refer to Division 01 - Product Requirements.

B. General requirements: Factory-assembled hollow sheet metal construction with fully mitered and welded corners, integral counterflashing, internal reinforcing, and top side and edges formed to shed water.

1. Sheet Metal: Hot-dip zinc coated steel sheet complying with ASTM A653/A653M, SS Grade 33 ; G60 coating designation; 18 gage, 0.048 inch thick.

2. Roofing Cants: Provide integral sheet metal roofing cants dimensioned to begin slope at top of roofing insulation; 1:1 slope; minimum cant height 4 inches.

3. Manufacture curb bottom and mounting flanges for installation directly on roof deck, not on insulation; match slope and configuration of roof deck.
4. Provide the layouts and configurations shown on the drawings.

C. Roof Curbs: Provide curb on all sides of opening, with top of curb horizontal for equipment mounting.
1. Provide preservative treated wood nailers along top of curb.
2. Insulate inside curbs with 1-1/2 inch thick fiberglass insulation.
3. Height Above Finished Roof Surface: 12 inches, minimum.
4. Height Above Roof Deck: 14 inches, minimum.

D. Equipment Rails: Two-sided curbs in straight lengths, with top horizontal for equipment mounting.
1. Provide preservative treated wood nailers along top of rails.
2. Height Above Finished Roof Surface: 6 inches, minimum.
3. Height Above Roof Deck: 14 inches, minimum.

E. Pipe, Duct, and Conduit Mounting Pedestals: Vertical posts, minimum 8 inches square unless otherwise indicated.
1. Provide preservative treated wood nailers over entire top surface, for supports to be provided .
2. Height Above Finished Roof Surface: 12 inches, minimum.
3. Height Above Roof Deck: 14 inches, minimum.

2.02 SLEEVES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop.

C. Sleeves for Rectangular Openings: Galvanized sheet steel.
1. Minimum Metal Thickness:
a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."

2.03 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi, 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

2.04 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.
1. Sealing Elements: EPDM-rubber or NBR interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
2. Pressure Plates: Carbon steel.
3. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements.

2.05 **ESCUTCHEONS/TRIM RINGS**

A. Description: Manufactured wall and ceiling escutcheons, floor plates, and duct trim rings, with an ID to closely fit around pipe/duct/insulation surface and with an OD that completely covers opening.

B. One-Piece, deep-drawn or cast metal with polished chrome plated finish and set screw.

C. Split, cast metal with concealed hinge polished chrome plated finish and set screw.

D. Rectangular trim rings shall be formed metal with mitered corners.

2.06 PIPE, TUBE, AND FITTINGS

A. For condensate drain piping, refer to Division 22 piping sections for pipe, tube, and fitting materials and joining methods.

B. For HVAC piping, refer to individual Division 23 piping sections for pipe, tube, and fitting materials and joining methods.

C. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.07 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.

D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig minimum working pressure to suit system pressures.

E. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.

F. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.

PART 3 EXECUTION

3.01 HVAC DEMOLITION

A. Refer to Division 01 Section "Cutting and Patching" and Division 02 Section "Selective Structure Demolition" for general demolition requirements and procedures.
B. Contractor shall be responsible for all work and costs associated with demolition shown or noted on plans.
C. Verify exact requirements before bid and include direct and related indirect costs in estimate including permit application, fees, dust control, protection of existing, temporary HVAC, fuel usage, scaffolding, disconnection, disposal, cutting and patching.
D. Occupied Buildings: For occupied buildings, coordinate with local management for communication with building users, occupants, and/or residents regarding potential for disruption, and provide 72 hour advance notification for planned outages. Install new work to the fullest extent possible before interrupting existing services to minimize disruption to residents. Provide temporary heat/cooling equipment for disruptions lasting over 4 hours.
E. In performing the work:
   1. Coordinate with existing conditions and other trades before starting work.
   2. Remove portions of walls, floors, ceilings, etc. required for access to demolished and new work.
   3. Disconnect, demolish, and remove systems, equipment, and components indicated to be removed.
   4. Piping to Be Removed: Remove portion indicated to be removed and cap or plug remaining with same or compatible piping material.
   5. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
   6. Ducts to Be Removed: Remove portion of ducts indicated to be removed and cap remaining ducts with same or compatible duct material.
   7. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.
   8. Equipment to Be Removed: Arrange for disconnection of electrical power. Disconnect and cap services and remove equipment. Remove related supports, anchorages, and concrete bases.
   9. Equipment to Be Removed and Reinstalled: Arrange for disconnection of electrical power. Disconnect and cap services and remove, clean, and store equipment. When appropriate, reinstall, reconnect, arrange for power connection and make equipment operational.
   10. Equipment to Be Removed and Salvaged: Arrange for disconnection of electrical power. Disconnect and cap services, remove equipment and deliver to Owner.
F. If new or existing to remain products are damaged during demolition, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.
G. Subcontract the General Contractor to perform patching, repair or replacement of walls floors, ceilings, etc. removed for access to the work. General contractor shall repair finishes to match surrounding finishes.

3.02 **COMMON REQUIREMENTS**

A. Install according to manufacturer requirements and other Division specification sections.
B. Drawing plans, schematics, and diagrams indicate general location and arrangement of systems. Indicated locations and arrangements were used to size and calculate friction loss, expansion, pump sizing, and other design considerations. Install as indicated unless deviations to layout are approved on Coordination Drawings.
C. Install in concealed locations, unless otherwise indicated and except in equipment rooms and service areas. Where located within walls and other concealed areas subject to damage, provide suitable protection.
D. If exposed, install at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
E. Where above accessible ceiling, install tight to structure with sufficient space for ceiling panel removal.
F. Materials exposed within plenums shall be noncombustible or have a flame spread index of 25 or less and a smoke-developed index of 50 or less.
G. Install to allow servicing.
H. Install piping at indicated slopes and free of sags and bends.
I. Install fittings for changes in direction and branch connections.
J. Install piping to allow application of insulation.
K. Select system components with pressure rating equal to or greater than system operating pressure.
L. Install piping escutcheons/duct trim rings for exposed penetrations of walls, ceilings, and floors.

3.03 **PENETRATIONS**

A. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls. Sleeve ends shall be flush with both wall surfaces unless otherwise noted. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Concrete and masonry penetrations: seal space outside of sleeves with grout. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
B. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
C. Roof-Penetrations: Penetrations shall use premanufactured pipe curbs fastened to deck with insulation and roofing membrane applied by roofing contractor. Seal penetrations into curb with flexible boots, with sealant between pipe and boot with pipe clamp for compression around perimeter.
D. Aboveground, Exterior-Wall Penetrations: Position pipe in center of sleeve. Maintain 1% outward slope, unless otherwise indicated. Seal penetrations using non-expanding foam. After cured, trim flush with sleeve end and paint with color to match surrounding finish.
E. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

F. Rated Assembly Penetrations: Maintain indicated fire and smoke ratings of walls, partitions, ceilings, and floors. Coordinate selection and application of firestopping specified in Division 07. Comply with requirements in Division 07.
G. For ducted penetrations of fire and/or smoke rated assemblies, provide dampers to maintain fire and/or smoke rating. Provide dynamically rated fire dampers for penetrations of wall and noncombustible floor assemblies. Provide combination fire and smoke dampers for corridors and other fire/smoke rated assemblies. Provide ceiling radiation dampers for combustible floor/ceiling assemblies with interlock to shut down fan. Fire and smoke damper products and execution requirements are specified elsewhere in Division 23.
H. For non-ducted penetrations of fire and/or smoke rated floor and wall assemblies, apply firestopping to restore original fire-resistance rating of assembly. Firestopping shall comply with listing of rated assembly. Firestopping materials and installation requirements are specified in Division 07.
I. Penetrations of membranes shall be protected by UL listed products. Coordinate exact installation conditions with selected fire sealants supplier. For penetrations which do not have a standard UL installation detail, arrange for engineering determination from manufacturer and/or sealant supplier, furnish details to inspecting authority and provide products and execution to match listing details.

3.04 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.
B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
   1. Comply with ASTM F 402, for safe-handling practice of cleaners, primers, and solvent cements.
   2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
   3. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
   4. PVC Non-pressure Piping: Join according to ASTM D 2855.
J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
K. Plastic Non-pressure Piping Gasketed Joints: Join according to ASTM D 3212.
L. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
   1. Plain-End Pipe and Fittings: Use butt fusion.
   2. Plain-End Pipe and Socket Fittings: Use socket fusion.
M. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.05 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:
   1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
   2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
   3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
   4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.06 **INSTALLATION - COMMON REQUIREMENTS**

A. Install equipment, devices, and specialties according to manufacturer installation instructions and recommendations.
B. Refer to other Sections of these Specifications for additional requirements.
C. Install to allow maximum possible headroom unless specific mounting heights are indicated. Provide warning markers for all work below 7'-6" above walking surface.
D. Install work level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
E. Install work to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
F. Install work to allow right of way for piping with required slope.

G. Contact equipment manufacturer's representative to visit site and observe installation in order to confirm installation requirements and warranty coverage. Document observation in writing and include in O&M manuals.
H. Provide service and maintenance for not less than one year from the Date of Substantial Completion or for the warranty period specified in Division 01, whichever is longer. Refer to Division 01 for additional service and requirements.

3.07 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
   1. Provide concrete bases which are plumb, level and fully supported to prevent shifting over time.
   2. Provide concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
   3. Place and secure anchorage devices. Install according to equipment manufacturer's recommendations, setting drawings, templates, diagrams, instructions, and directions for supported equipment. Provide anchor bolts according to anchor-bolt manufacturer's written instructions. Install anchor bolts to elevations required for proper attachment to supported equipment. Unless otherwise noted, install epoxy-coated anchor bolts to match equipment that extend through concrete base, and anchor into structural concrete.
   4. Where located on structural floor, provide dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of the base.
   5. Provide 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section "Cast-in-Place Concrete."

3.08 SUPPORTS AND ANCHORAGES

A. Provide supports to match construction type and adjacent assembly rating.
B. For combustible construction, provide wood supports and anchorages. Cut, fit, and place nailers, blocking, and anchorages to support, and anchor materials and equipment to structure (not drywall or decking). Provide fasteners that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Predrill holes to prevent splitting wood members.
C. Provide fasteners to connect supports into structural framing (not drywall, ceiling, or deck). Provide 1/8" diameter structural screws, 1" into framing, on 16" centers 16" O.C. (min.) unless noted otherwise. For exterior applications, account for both gravity and windloading (overturning and uplift) forces.
D. For non-combustible building construction provide metal supports and anchorages. Refer to Division 05 Section "Metal Fabrications" for structural steel. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment. Field Welding shall comply with AWS D1.1.

3.09 GROUTING

A. Clean surfaces that will come into contact with grout. Provide forms for placement of grout.
B. Mix and install grout for HVAC equipment base bearing surfaces, and anchors.
C. Place grout around anchors and completely filling equipment base and provide smooth bearing surface for equipment. Avoid air entrapment during placement of grout.
D. Allow grout to cure before loading or applying forces.

3.10 SLEEVE-SEAL INSTALLATION

A. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

END OF SECTION 230500

SECTION 23 0548 - VIBRATION AND SEISMIC CONTROLS FOR HVAC

PART 1 GENERAL

1.01 Section Includes
- A. Vibration isolation requirements.
- B. Vibration isolators.

1.02 Reference Standards
- A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- B. ASHRAE (HVACA) - ASHRAE Handbook - HVAC Applications; Most Recent Edition Cited by Referring Code or Reference Standard.

1.03 Administrative Requirements
- A. Coordination:
  1. Coordinate selection and arrangement of vibration isolation and/or seismic control components with the actual equipment to be installed.
  2. Coordinate the work with other trades to provide additional framing and materials required for installation.
  3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
  4. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
  1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 3000.

1.04 Submittals
- A. Product Data: Provide manufacturer's standard catalog pages and data sheets for products, including materials, fabrication details, dimensions, and finishes.
  1. Vibration Isolators: Include rated load capacities and deflections; include information on color coding or other identification methods for spring element load capacities.
  2. Installation: Include isolator manufacturer installation recommendations.
- B. Shop Drawings - Vibration Isolation Systems:
  1. Include dimensioned plan views and sections indicating proposed arrangement of vibration isolators; indicate equipment weights and static deflections.
- C. Manufacturer’s detailed field testing and inspection procedures.
- D. Refer to Division 01 - Administrative Requirements, for submittal procedures.
- E. Shop Drawings:
  1. Include delegated design calculations that indicate compliance with the applicable building code (structural and wind loading), and isolation efficiency of the assembly.

1.05 Quality Assurance
- A. Comply with applicable building code.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Perform delegated design and installation in accordance with applicable codes.

PART 2 PRODUCTS

2.01 Vibration Isolation Requirements
- A. Design and provide vibration isolation systems to reduce vibration transmission to supporting structure from vibration-producing HVAC equipment and/or HVAC connections to vibration-isolated equipment.
- B. Comply with applicable general recommendations of ASHRAE (HVACA), where not in conflict with other specified requirements:
- C. General Requirements:
  1. Select vibration isolators to provide required static deflection.
  2. Select vibration isolators for uniform deflection based on distributed operating weight of actual installed equipment.
  3. Select vibration isolators for outdoor equipment to comply with wind design requirements.
  4. Select vibration-isolated equipment support bases and associated vibration isolators to provide minimum 2-inch operating clearance beneath base unless otherwise indicated.
- D. Equipment Isolation: As indicated on drawings and as scheduled in ASRAE Handbook (2015 Applications Chapt. 48) based on equipment, application and structure.

2.02 PERFORMANCE REQUIREMENTS
- A. General:
  1. All equipment mounted on vibration isolated bases to have minimum operating clearance of 2 inches between the base and floor or support beneath unless noted otherwise.

2.03 Vibration Isolators
- A. Manufacturers:
  1. Vibration Isolators:
     - a. Kinetics Noise Control, Inc: www.kineticsnoise.com/#sle.
     - b. Mason Industries: www.mason-ind.com/#sle.
     - c. Vibration Eliminator Company, Inc: www.veco-nyc.com/#sle.
     - d. Substitutions: See Section 01 6000 - Product Requirements.

2. Source Limitations: Furnish vibration-isolators and associated accessories produced by a single manufacturer and obtained from a single supplier.

B. General Requirements:

1. Spring Elements for Spring Isolators:

a. Color code or otherwise identify springs to indicate load capacity.

b. Lateral Stability: Minimum lateral stiffness to vertical stiffness ratio of 0.8.

c. Designed to operate in the linear portion of their load versus deflection curve over deflection range of not less than 50 percent above specified deflection.

d. Designed to provide additional travel to solid of not less than 50 percent of rated deflection at rated load.

e. Selected to provide designed deflection of not less than 75 percent of specified deflection.

f. Selected to function without undue stress or overloading.

C. Vibration Isolators for Nonseismic Applications:

D. Non-Seismic Type:

1. Spring Hanger:

a. Housing: Steel construction containing stable steel spring and integral glass fiber or elastomeric element preventing metal to metal contact.

PART 3 EXECUTION

3.01 Examination

A. Coordinate proposed equipment locations with structural shop drawings and structure before ordering equipment.

B. Verify sructure with field measurements before placing equipment supports.

C. Verify that mounting surfaces are ready to receive vibration isolation and/or seismic control components and associated attachments.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 Installation

A. Install products in accordance with manufacturer's instructions.

B. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.

C. Secure fasteners according to manufacturer's recommended torque settings.

D. Install flexible piping connections to provide sufficient slack for vibration isolation and/or seismic relative displacements as indicated.

E. Vibration Isolation Systems:

1. Clean debris from beneath vibration-isolated equipment that could cause short-circuiting of isolation.

2. Use elastomeric grommets for attachments where required to prevent short-circuiting of isolation.

3. Adjust isolators to be free of isolation short circuits during normal operation.

4. Do not overtighten fasteners such that resilient material isolator pads are compressed beyond manufacturer's maximum recommended deflection.

3.03 Field Quality Control

A. Provide services of a manufacturer's authorized representative for vibration isolation systems to observe installation and assist in inspection and testing. Include manufacturer's detailed testing and inspection procedures and field reports with submittals.

B. Vibration Isolation Systems:

1. Verify isolator static deflections.

2. Verify vibration isolation performance during normal operation; investigate sources of isolation short circuits.

C. Correct deficiencies and replace damaged or defective vibration isolation and/or seismic control components.

D. Refer to Division 01 - Quality Requirements, for additional requirements.

END OF SECTION

SECTION 23 0553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates.
B. Tags.
C. Adhesive-backed markers.
D. Ceiling tacks.

1.02 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements for submittal procedures.
B. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.
C. Schedule: Submit schedules of equipment and valves including tag, location, function, and manufacturer's name and model number.
D. Product Data: Provide manufacturers catalog literature for each product required.
E. Manufacturer's Installation Instructions: Indicate special procedures, and installation.
F. Project Record Documents: Record locations of equipment, dampers and valves.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

A. Air Handling Units: Nameplates.
B. Condensing Units: Nameplates.
C. Air Terminal Units: Tags.
D. Clothes Dryer Exhaust Duct Length Identification: Tags.
E. Control Panels: Nameplates.
F. Dampers: Ceiling tacks, where located above lay-in ceiling.
G. Ductwork: Adhesive backed markers or stencilled painting. Use only where not exposed to public.
H. Piping: Adhesive backed markers or stencilled painting.
I. Pumps: Nameplates.
J. Thermostats: Nameplates.

2.02 NAMEPLATES

A. Manufacturers:
  1. Letter Color: White.
  2. Letter Height: 1/4 inch.
  3. Background Color: Black.
  4. Plastic: Comply with ASTM D709.

2.03 TAGS

A. Manufacturers.
B. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
C. Metal Tags: Aluminum with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

2.04 **ADHESIVE-BACKED MARKERS**

A. Material: High gloss acrylic adhesive-backed vinyl film 0.0032 inch; printed with UV and chemical resistant inks.
B. Style: Individual Label.
C. Color: Varies by use. Match owner preference.

2.05 CEILING TACKS

A. Description: Steel with 3/4 inch diameter color coded head.
B. Color code as follows:
  1. HVAC Equipment: Yellow.
  2. Fire Dampers and Smoke Dampers: Red.
  3. Heating/Cooling Valves: Blue.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
B. Clothes Dryer Exhaust Duct Length Identification: Where the exhaust duct is concealed within the building construction, the equivalent length of the exhaust duct shall be indentified on a permanent tag. The tag shall be located within 6 feet of the exhaust duct connection.
C. Install in accordance with manufacturer's instructions.
D. Use tags on piping 3/4 inch diameter and smaller.
  1. Identify service, flow direction, and pressure.
E. Install ductwork with markers or stencils visible from points of access (not on exposed ducts in public areas). Identify with air handling unit identification number and area served. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction.
F. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.
G. Provide "Low Clearance" warning labels for all equipment, ducts, piping and other work with headroom below 6'-6".
H. Provide "Trip Hazard" warning labels for all work acoss or restricting a 30" path of travel.

END OF SECTION

SECTION 23 0593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Testing, adjustment, and balancing of air systems.
B. Measurement of final operating condition of HVAC systems.
C. Sound measurement of equipment operating conditions.

1.02 REFERENCE STANDARDS

A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition; 2016.
B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems; 2008, with Errata (2019).

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Qualifications: Submit name of adjusting and balancing agency and TAB supervisor for approval within 30 days after award of Contract.
C. TAB Agency Required Qualifications:
   1. An independent, 3rd party agency specializing in the testing, adjusting, and balancing of systems specified in this section.
   2. Having minimum of three years documented experience.
   3. Certified by one of the following:
      a. AABC, Associated Air Balance Council: www.aabc.com/#sle; upon completion submit AABC National Performance Guaranty.
D. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.
E. Pre-Qualified TAB Agencies:
   1. Kahoe.
   2. Melink
F. Final Report: Indicate measurements and note deficiencies that prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
   1. Submit under provisions of Division 01.
   2. Submit to the Engineer within two weeks after completion of testing, adjusting, and balancing.
   3. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect and for inclusion in operating and maintenance manuals.
   4. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
   5. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
   6. Units of Measure: Report data in I-P (inch-pound) units only.
   7. Include the following on the title page of each report:
      a. Name of Testing, Adjusting, and Balancing Agency.
      b. Address of Testing, Adjusting, and Balancing Agency.
      c. Telephone number of Testing, Adjusting, and Balancing Agency.
      d. Project name.
      e. Project location.
      f. Project Architect.
      g. Project Engineer.
      h. Project Contractor.
      i. Report date.
G. Project Record Documents: Record actual locations of all balancing devices.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Perform total system balance in accordance with one of the following:
   1. AABC (NSTSB), AABC National Standards for Total System Balance.
   2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.

3.02 EXAMINATION

A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
   1. Systems are started and operating in a safe and normal condition.
   2. Temperature control systems are installed complete and operable.
   3. Proper thermal overload protection is in place for electrical equipment.
   4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
   5. Duct systems are clean of debris.
   6. Fans are rotating correctly.
   7. Fire and volume dampers are in place and open.
   8. Zone dampers and zone damper system is fully installed and operating properly.

9. Air coil fins are cleaned and combed.
10. Access doors are closed and duct end caps are in place.
11. Air outlets are installed and connected.
12. Duct system leakage is minimized.

B. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.
C. Beginning of work means acceptance of existing conditions.

3.03 PREPARATION

A. Hold a pre-balancing meeting at least one week prior to starting TAB work.
B. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Architect to facilitate spot checks during testing.

3.04 ADJUSTMENT TOLERANCES

A. Equipment: Adjust to within plus or minus 5 percent of design for supply systems.
B. Equipment: Adjust to within plus or minus 10 percent of design for return and exhaust systems.
C. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

3.05 RECORDING AND ADJUSTING

A. Field Logs: Maintain written logs including:
1. Running log of events and issues.
2. Discrepancies, deficient or uncompleted work.
3. Contract interpretation requests.
4. Lists of completed tests.

B. Ensure recorded data represents actual measured or observed conditions.
C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
D. Mark on drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.
E. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
F. Mark final settings on balancing devices with permanent marker, and photograph.
G. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
H. At final inspection, recheck random selections of data recorded in report. Recheck devices, equipment or areas (up to 10%) selected for witnessing by the Owner, Architect and/or Engineer.
I. Check and adjust systems approximately six months after final acceptance and submit report.

3.06 AIR SYSTEM PROCEDURE

A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
C. Measure air quantities at air inlets and outlets.
D. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
E. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
F. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
G. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
H. Check zone dampers for motorized damper leakage. Adjust air quantities with mixing dampers set first for cooling, then heating, then modulating.

3.07 SCOPE

A. Test, adjust, and balance all equipment and systems installed or modified under this contract.

3.08 MINIMUM DATA TO BE REPORTED

A. Electric Motors:
1. Manufacturer.
2. Model/Frame.
3. HP/BHP.
4. Phase, voltage, amperage; nameplate, actual, no load.
5. RPM.

B. Air Moving Equipment:
1. Location.
2. Manufacturer.
3. Model number.
4. Arrangement/Class/Discharge.
5. Air flow, specified and actual.
6. Return air flow, specified and actual.
7. Outside air flow, specified and actual.
8. Total static pressure, specified and actual.
9. Total external pressure, specified and actual.
10. Inlet pressure.

11. Discharge pressure.
12. Fan RPM.

C. Heating/Cooling/Makeup Equipment:
1. Identification/location.
2. Design and Actual air flow.
3. Design and actual return air flow.
4. Design and actual outside air flow.
5. Design and actual supply air temperature (after coil during heating/cooling)
6. Return air temperature.
7. Outside air temperature.
8. Mixed air temperature.
9. Design and actual outside/return air ratio.

D. Exhaust Fans:
1. Location.
2. Manufacturer.
3. Model number.
4. Air flow, specified and actual.
5. Total static pressure (total external), specified and actual.
6. Inlet pressure.
7. Discharge pressure.
8. Fan RPM.

E. Duct Traverses:
1. System equipment/zone/main ducts.
2. Duct size.
3. Area.
4. Design/actual velocity.
5. Design/actual air flow.
6. Duct design/actual static pressure.
7. Take airflow measurements no more than 6” apart at a minimum of 25 points, regardless of duct size.
8. Advise if return duct has no more than 0.5 duct equivalent straight diameters upstream of the fan.
9. Advise if supply duct mains have no more than 2.5 duct equivalent straight diameters downstream of the fan.
10. Although preferred in a straight section of duct, lack of a straight section of duct is not an excuse for omitting the duct traverse altogether. Call the Engineer before omitting the duct traverse.
11. If supply or return duct main traverse readings cannot be performed in order to perform duct leakage calculations, provide duct leakage testing (further below).

F. Duct Leak Calculation:
1. Description of equipment/ductwork tested.
2. Equipment/duct design/actual total pressure.
3. Equipment/duct design/actual static pressure.
4. Equipment/duct main air flow.
5. Sum of inlet/outlet air flows.
6. Calculated leakage (equipment flow less sum of inlets/outlets).

G. Duct Leak Tests (if duct traverse total flow not performed):
1. Description of equipment/ductwork tested.
2. Duct design/actual total pressure.
3. Duct design/actual static pressure.
4. Equipment/duct main air flow.
5. Sum of outlet air flows.
6. Maximum allowable leakage duct capacity times leak factor.
7. Test static pressure.
8. Test orifice differential pressure.
9. Leakage.

H. Air Distribution Tests:
1. Room number/location.
2. Design velocity.
3. Design air flow.
4. Test (final) velocity.
5. Test (final) air flow.
6. Percent of design air flow.
7. Supply air temperature at end of run(during heating/cooling)

I. Sound Level:
1. Location and dB level.
2. Octave bands - equipment off.
3. Octave bands - equipment on.
4. Normally acceptable readings.
5. Unusual conditions at time of test.

END OF SECTION

SECTION 23 0713 - DUCT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Duct insulation.
B. Duct liner.
C. Grease Duct Insulation.

1.02 REFERENCE STANDARDS

A. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation; 2020.
B. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material); 2019.
C. ASTM C1338 - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings; 2008.
D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
E. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2021.
F. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
G. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
H. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
C. Manufacturer's Instructions: Indicate installation procedures necessary to ensure acceptable workmanship and that installation standards will be achieved.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section with not less than three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.
B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.06 FIELD CONDITIONS

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, UL 723, ASTM E84, or UL 723.

2.02 GLASS FIBER, FLEXIBLE

A. Manufacturer:
   1. Knauf Insulation: www.knaufusa.com.
   2. Johns Manville: www.jm.com.
   3. Owens Corning Corporation: www.ocbuildingspec.com.
   4. CertainTeed Corporation: www.certainteed.com/#sle.
B. Vapor Barrier Jacket:
   1. Kraft paper with glass fiber yarn and bonded to aluminized film.
   2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
   3. Secure with pressure-sensitive tape.
C. Vapor Barrier Tape:
   1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure-sensitive rubber-based adhesive.

2.03 **KITCHEN EXHAUST (GREASE) DUCTS:**

A. Foil faced mineral fiber blanket fireproofing.
B. Manufacturers:
   1. Thermal Ceramics FireMaster FastWrap XL.
   2. 3m.
C. Fire rating: 2 hour resistance rating.
D. Tested in conformance with ASTM E2336.
E. Zero inch clearance to combustibles per UL 1978.
F. ASTM E84 flame/smoke rating less than 25/50.
G. Fire rated access door shall be used for access/cleanouts where required by code.
H. See specification 078205 for additional requirements.

2.04 **DUCT LINER: Return air plenum boxes.**

A. Manufacturers:
   1. Knauf Insulation: www.knaufusa.com.

2. Johns Manville: www.jm.com.
3. Owens Corning Corp: www.owenscorning.com.
4. CertainTeed Corporation: www.certainteed.com/#sle.

B. Glass Fiber Insulation: Non-corrosive, incombustible glass fiber complying with ASTM C1071; flexible blanket, rigid board, and preformed round liner board; impregnated surface and edges coated with poly vinyl acetate polymer, acrylic polymer, or black composite.
1. Fungal Resistance: No growth when tested according to ASTM G21.
2. Apparent Thermal Conductivity: Maximum of 0.23 at 75 degrees F.
3. Service Temperature: Up to 250 degrees F.
4. Rated Velocity on Coated Air Side for Air Erosion: 4,000 fpm, minimum.
5. Minimum Noise Reduction Coefficients:
a. 1 inch Thickness: 0.45.

C. Adhesive: Waterproof, fire-retardant type, ASTM C916.

D. Liner Fasteners: Galvanized steel, self-adhesive pad with integral head.

PART 3 EXECUTION

3.01 EXAMINATION

A. Test ductwork for design pressure prior to applying insulation materials.

B. Verify that surfaces are clean, foreign material removed, and dry.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NAIMA National Insulation Standards.

C. Insulated Ducts Conveying Air Below Ambient Temperature:
1. Provide insulation with vapor barrier jackets.
2. Finish with tape and vapor barrier jacket.
3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
4. Insulate entire system, including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.

D. Insulated Ducts Conveying Air Above Ambient Temperature:
1. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.

E. Exterior Applications: Provide closed cell foam elastomeric or polyisocyuranate insulation with weather barrier. On horizontal surfaces, provide tapered insulation to prevent ponding. Cover exterior with aluminum jacket and locate seams on bottom (12" and smaller) or in weatherboard fashion (larger than 12"), and seal seams with caulk.

F. External Duct Insulation Application:
1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
2. Install without sag on underside of duct. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct off trapeze hangers and insert spacers.
3. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
4. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

G. Duct and Plenum Liner Application:
1. Secure insulation with mechanical liner fasteners. Refer to SMACNA (DCS) for spacing.
2. Seal and smooth joints. Seal and coat transverse joints.
3. Seal liner surface penetrations with adhesive.

3.03 SCHEDULES

A. Exhaust Ducts Within 10 ft of Exterior Openings (louvers or brick vents): Glass Fiber, Flexible, 1-1/2 inches thick, minimum installed R-value 4.2 and 0.75 lb/cu. ft. nominal density.

B. Indoor, Concealed and Exposed, Outside Air Intake Ducts: Glass Fiber, Flexible, 1-1/2 inches thick, minimum installed R-value 6.0 and 0.75 lb/cu. ft. nominal density.

C. Plenums: Glass Fiber, Flexible, 1-1/2 inches thick, minimum installed R-value 6.0 and 0.75 lb/cu. ft. nominal density.

D. Indoor, Concealed Supply Ducts: Glass Fiber, Flexible, 1-1/2 inches thick, minimum installed R-value 6.0 and 0.75 lb/cu. ft. nominal density.

E. Indoor, Exposed Supply Ducts: Glass Fiber, Flexible, 1-1/2 inches thick, minimum installed R-value 6.0 and 0.75 lb/cu. ft. nominal density.

F. Outdoor, Concealed (attics & other unconditioned spaces) Supply Ducts: Glass Fiber, Flexible, 3 inches thick, minimum installed R-value 8.0 and 0.75 lb/cu. ft. nominal density.

G. Outdoor, Concealed (attics & other unconditioned spaces) Return Ducts: Glass Fiber, Flexible, 3 inches thick, minimum installed R-vaule 8.0 and 0.75 lb/cu. ft. nominal density.

H. Outdoor, Concealed (attics & other unconditioned spaces) Transfer Ducts: Glass Fiber, Flexible, 3 inches thick, minimum installed R-value 8.0 and 0.75 lb/cu. ft. nominal density.

I. Supply, Return, Exhaust Ducts Exposed to Outdoors, Exterior to the building: Closed cell elastomeric or polyisocyuranate, 3 inches thick, 0.75 lb/cu.ft. nominal density, overlapping seams, and R-value 8.0 minimum.

END OF SECTION

SECTION 23 2300 - REFRIGERANT PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Piping.
B. Refrigerant.
C. Moisture and liquid indicators.
D. Valves.
E. Filter-driers.
F. Engineered wall seals and insulation protection.

1.02 REFERENCE STANDARDS

A. ASME B31.5 - Refrigeration Piping and Heat Transfer Components; 2020.
B. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service; 2020.
C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2021.
E. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
F. ASTM B1003 - Standard Specification for Seamless Copper Tube for Linesets (2016).
G. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2020a.
H. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
I. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
J. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
K. ASTM G153 - Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials; 2013 (Reapproved 2021).

1.03 SYSTEM DESCRIPTION

A. Where more than one piping system material is specified ensure system components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.
B. Provide pipe hangers and supports in accordance with ASME B31.5 unless indicated otherwise.
C. Liquid Indicators.
D. Valves.
    1. Use service valves on suction and discharge of compressors.
    2. Use gauge taps at compressor inlet and outlet.
E. Refrigerant Charging (Packed Angle) Valve: Use in liquid line between receiver shut-off valve and expansion valve.
F. Filter-Driers:
    1. Use a filter-drier immediately ahead of liquid-line controls, such as thermostatic expansion valves, solenoid valves, and moisture indicators.
    2. Use sealed filter-driers in systems utilizing hermetic compressors.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide general assembly of specialties, including manufacturers catalogue information. Provide manufacturers catalog data including load capacity.
C. Manufacturer's Installation Instructions: Indicate support, connection requirements, and isolation for servicing.
D. Maintenance Data: Include instructions for changing cartridges, assembly views, spare parts lists.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store piping and specialties in shipping containers with labeling in place.
B. Protect piping and specialties from entry of contaminating material by leaving end caps and plugs in place until installation.
C. Dehydrate and charge components such as piping and receivers, seal prior to shipment, until connected into system.

PART 2 PRODUCTS

2.01 SYSTEM DESCRIPTION

A. Filter-Driers:
    1. Use a filter-drier immediately ahead of liquid-line controls, such as thermostatic expansion valves, solenoid valves, and moisture indicators.

2.02 REGULATORY REQUIREMENTS

2.03 PIPING

A. Copper Tube: ASTM B280, H58 hard drawn or O60 soft annealed.
B. Copper Tube to 7/8-inch OD: ASTM B88 (ASTM B88M), Type K (A), annealed.
C. Pipe Supports and Anchors:
    1. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron adjustable swivel, split ring.

2.04 MOISTURE AND LIQUID INDICATORS

A. Indicators: Single port type, UL listed, with copper or brass body, flared or soldered ends, sight glass, color coded paper moisture indicator with removable element cartridge and plastic cap; for maximum temperature of 200 degrees F and maximum working pressure of 500 psi.

2.05 VALVES

A. Service Valves:

1. Forged brass body with copper stubs, brass caps, removable valve core, integral ball check valve, flared or soldered ends, for maximum pressure of 500 psi.

2.06 FILTER-DRIERS

A. Cores: Molded or loose-fill molecular sieve desiccant compatible with refrigerant, activated alumina, activated charcoal, and filtration to 40 microns, with secondary filtration to 20 microns; of construction that will not pass into refrigerant lines.

B. Construction: UL listed.

1. Connections: As specified for applicable pipe type.

2.07 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

A. Manufacturer:

1. Standard products furnished by tubing manufacturer.

B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.

1. Minimum Service Temperature: Minus 40 degrees F.
2. Maximum Service Temperature: 180 degrees F.
3. Connection: Waterproof vapor barrier adhesive.
4. R Value: > R-3 h-SF-deg.F/BTU minimum.
5. Thickness: >.75" minimum.
6. K value: < .245 BTU-in./(h-SF-deg.F) per ASTM C177.
7. Permeability: < .01 perm-in.

2.08 ENGINEERED WALL SEALS AND INSULATION PROTECTION

A. Manufacturers:

1. Airex Manufacturing, Inc: www.airexmfg.com/#sle.
2. Substitutions: Refer to Division 01 - Product Requirements.

B. Pipe Penetration Wall Seal: Seals HVAC piping wall penetrations with compression gasket wall mounted rigid plastic outlet cover.

1. Outlet Cover Color: Selected by architect.
2. Water Penetration: Comply with ASTM E331.
3. Air Leakage: Comply with ASTM E283/E283M.
4. Air Permeance: Comply with ASTM E2178.

C. Insulation Protection System: Mechanical line insulation and PVC cover.

1. PVC Insulation Cover Color: as selected by architect with full-length velcro fastener.
2. Weatherization and Ultraviolet Exposure Protection: Comply with ASTM G153.
3. Water/Vapor Permeability: Comply with ASTM E96/E96M.
4. Anti-Fungal and Anti-Microbial Resistance: Comply with ASTM G21.
5. Flame Spread and Smoke Development Rating of 25/450: Comply with ASTM E84.
6. Adhesive free.

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

A. Install refrigeration specialties in accordance with manufacturer's instructions.

B. Route piping in orderly manner, with plumbing parallel to building structure, and maintain gradient.

C. Install piping to conserve building space and avoid interference with use of space.

D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

E. Pipe Hangers and Supports.

F. Arrange piping to return oil to compressor. Provide traps and loops in piping, and provide double risers. Slope horizontal piping 0.40 percent in direction of flow.

G. Provide access to concealed valves and fittings. Coordinate size and location of access doors with Section 08 3100.

H. Flood piping system with nitrogen when brazing.

I. Where pipe support members are welded to structural building frame, brush clean, and apply one coat of zinc rich primer to welding.

J. Insulate piping; refer to Section and Section 22 0716.

K. Provide replaceable cartridge filter-driers, with isolation valves and valved bypass.

L. Install flexible connectors at right angles to axial movement of compressor, parallel to crankshaft.

3.03 FIELD QUALITY CONTROL

A. Refer to Division 01 - Quality Requirements, for additional requirements.

B. Test refrigeration system in accordance with ASME B31.5.

C. Pressure test system with dry nitrogen to 200 psi. Perform final tests at 27 inches vacuum and 200 psi using halide torch. Test to no leakage.

3.04 SCHEDULES

A. Hanger Spacing for Copper Tubing.
   1. 1/2 inch, 5/8 inch, and 7/8 inch OD: Maximum span, 5 feet; minimum rod size, 1/4 inch.
   2. 1-1/8 inch OD: Maximum span, 6 feet; minimum rod size, 1/4 inch.

END OF SECTION

SECTION 23 3100 - HVAC DUCTS AND CASINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal ducts.
B. Flexible ducts.
C. Nonmetal ducts.
D. Air plenums and casings.
E. Ducts for kitchen exhaust applications.

1.02 REFERENCE STANDARDS

A. ASHRAE (FUND) - ASHRAE Handbook - Fundamentals; Most Recent Edition Cited by Referring Code or Reference Standard.
B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
D. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
E. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.
F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
G. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).
H. ASTM E2336 - Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems; 2020.
I. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2015.
J. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry Elements; 2015.
K. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2015.
L. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2016.
M. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2021.
N. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2021.
O. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
P. SMACNA (KVS) - Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines; 2001.
Q. SMACNA (LEAK) - HVAC Air Duct Leakage Test Manual; 2012.
R. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; current edition, including all revisions.
S. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.
T. UL 1978 - Grease Ducts; Current Edition, Including All Revisions.
U. UL 2221 - Tests of Fire Resistive Grease Duct Enclosure Assemblies; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data for duct materials.
C. Shop Drawings: Indicate duct fittings, particulars such as gages, sizes, welds, and configuration prior to start of work for 2" pressure class and higher systems.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience, and approved by manufacturer.

1.05 REGULATORY REQUIREMENTS

A. Construct ductwork to NFPA 90A standards.

1.06 FIELD CONDITIONS

A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
B. Maintain temperatures within acceptable range during and after installation of duct sealants.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Provide UL Class 1 ductwork, fittings, hangers, supports, and appurtenances in accordance with NFPA 90A and SMACNA (DCS) guidelines unless stated otherwise.
B. Provide metal duct unless otherwise indicated.
C. Duct Shape and Material in accordance with Allowed Static Pressure Range:
D. Duct Sealing and Leakage in accordance with Static Pressure Class:
E. Duct Fabrication Requirements:
    1. Duct and Fitting Fabrication and Support: SMACNA (DCS) including specifics for continuously welded round and oval duct fittings.
    2. No variation of duct configuration or size permitted except by written permission. Size round duct installed in place of rectangular ducts in accordance with ASHRAE (FUND) Handbook - Fundamentals.
    3. Use reinforced and sealed sheet-metal materials at recommended gauges for indicated operating pressures or pressure class.
    4. Provide turning vanes of perforated metal with glass fiber insulation when acoustical lining is indicated.
    5. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
    6. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame, provide blank-out panels sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.

F. Low Pressure Supply (Heating or Cooling Systems): 12 inch dimension and smaller: 1 inch w.g. pressure class, galvanized steel.
   1. Within a single fire area: Construct of 28 gage.
   2. Through rated assemblies and egress areas: Construct of 24 gauge.
G. Low Pressure Supply (Heating or Cooling Systems): 12 inch dimension and larger: 2 inch w.g. pressure class, galvanized steel.
   1. Construct of 24 gage.
H. Return and Relief: 1 inch w.g. pressure class, galvanized steel.
   1. Construct of 26 gage.
I. General Exhaust: 1/2 inch wg pressure class, galvanized steel.
   1. Construct of 26 gage.
J. Dryer Exhaust: 1/2 inch w.g. pressure class, galvanized steel.
   1. Construct of .016" thick (26 gage) with transitions pointing in direction of airflow.
K. Commercial Kitchen Cooking Hood and Grease Exhaust (manufactured): 1 inch w.g. pressure class, stainless steel.
   1. Construct of 18 gage, 0.0500 inch stainless steel using continuous welded joints.
L. Dishwasher Exhaust: 1 inch w.g. pressure class, stainless steel.
   1. Construct of 18 gauge, 0.0500 inch stainless steel using continuous external sealed joints in rectangular sections.
M. Commercial Kitchen Cooking Hood and Grease Exhaust (field welded): 1 inch w.g. pressure class, un-galvanized steel.
   1. Construct of 16 gauge un-galvanized steel.
N. Outside Air Intake: 1 inch w.g. pressure class, galvanized steel.
   1. Construct of 26 gage.

2.02 MATERIALS
A. Stainless Steel for Ducts: ASTM A666, Type 304.
B. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
   1. Type: Heavy mastic or liquid, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.
   2. VOC Content: Not more than 250 g/L, excluding water. Confirm with green rater (if applicable).
   3. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.
   4. For Use with Flexible Ducts: UL labeled.
C. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.
D. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
   1. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
   2. Masonry Wedge Expansion Anchors: Complying with ICC-ES AC01.
   3. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
   4. Masonry Screw Type Anchors: Complying with ICC-ES AC106.
   5. Concrete Adhesive Type Anchors: Complying with ICC-ES AC308.
   6. Other Types: As required.

2.03 DUCTWORK FABRICATION
A. Fabricate and support in accordance with SMACNA (DCS) and as indicated.
B. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
C. Construct T's, bends, and elbows with inside radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide air foil turning vanes of galvanized metal.
D. Change duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
E. Change duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
F. Fabricate continuously welded round and oval duct fittings in accordance with SMACNA (DCS).
G. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame, provide blank-out box sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.

2.04 METAL DUCTS
A. Material Requirements:
   1. Galvanized Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.

2.05 FLEXIBLE DUCTS
A. Flexible Air Ducts:
   1. UL 181, Class 1, multiple layers of aluminum laminate supported by helically wound spring steel wire.
   2. Insulation: Fiberglass insulation with polyethylene vapor barrier film.
   3. Pressure Rating: From 10 in-wc positive to 1 in-wc negative.
   4. Maximum Velocity: 4,000 fpm.
   5. Temperature Range: Minus 20 to 210 degrees F.

2.06 NON-METAL DUCTS
A. Flexible Ducts: Multiple layers of aluminum laminate supported by helically wound spring steel wire.
   1. Pressure Rating: 10 inches wg positive and 1.0 inches wg negative.
   2. Maximum Velocity: 4000 fpm.
   3. Temperature Range: Minus 20 degrees F to 210 degrees F.

B. Condensing Gas Appliance Flue Gas Venting (FGV)
   1. PVC schedule 40, solid core, dual rated ASTM D1785 - UL 1738 pipe may be used for combustion air intakes or as specified by appliance manufacturer where installed in accordance with both appliance and piping listings.
   2. CPVC schedule 40, solid core, dual rated ASTM F441 - UL 1738 pipe may be used for combustion intake and exhaust where installed in accordance the appliance and piping listings.
   3. Polypropylene, dual rated ULCS 636 - UL 1738 pipe, or as specified by appliance manufacturer, may be used for combustion exhaust where installed in accordance with the appliance listing.
      a. Materials as specified by pipe manufacturer shall be used for joint assembly.
   4. Stainless Steel AL29-4C certified for category IV and direct vent appliance venting shall be used when other specified materials are not included in appliance listing.
   5. Do not mix components from different systems or different manufacturers. When changing from one material to another, use adapters specifically designed and listed for that purpose. System failure due to mixed materials and systems shall be the responsibility of the contractor.
   6. Roof terminations shall incorporate vertical concentric vent kit with rain cap.
   7. Wall terminations shall use paintable low profile termination kit unless express permission is given in writing by owner, architect and engineer.
   8. Install terminations and maintain clearances in accordance with appliance listings.
   9. Foam core pipe (all materials) shall not be used for venting products of combustion.

2.07 AIR PLENUMS AND CASINGS

A. Fabricate in accordance with SMACNA (DCS) for indicated operating pressures indicated.
B. Minimum Fabrication Requirements:
   1. Fabricate acoustic plenum or casing with reinforcing turned inward.
   2. Provide 16-gauge, 0.059-inch sheet steel back facing and 22-gauge, 0.029-inch perforated sheet steel front facing with 3/32 inch diameter holes on 5/32 inch centers.
   3. Construct panels 3 inches thick, packed with 4.5 pcf minimum glass fiber insulation media, on inverted channel of 16-gauge, 0.059-inch sheet steel.
   4. Mount floor-mounted plenum or casings on 4-inch high concrete curbs. At floor, rivet panels on 8-inch centers to angles. Where floors are acoustically insulated, provide liner of galvanized 18-gauge, 0.052-inch expanded metal mesh supported at 12-inch centers, turned up 12 inches at sides with sheet metal shields.
C. Access Doors:
   1. Install hinged access doors where indicated or required for access to equipment for cleaning and inspection.
   2. Reinforce door frames with steel angles tied to horizontal and vertical plenum supporting angles.
   3. Provide clear wire glass observation ports, minimum 6 by 6 inch size.
D. Supply Plenums: Insulate interior with acoustic fiberglass with coating to prevent erosion into airstream.
E. Return Plenums: Insulate interior with acoustic fiberglass with coating to prevent erosion into airstream.

2.08 DUCTS FOR KITCHEN EXHAUST APPLICATIONS

A. Provide ductwork, fittings, and appurtenances in accordance with NFPA 96, SMACNA (KVS), UL 1978, and UL 2221 requirements and guidelines.
B. Class 1 duct for air with gas and grease particle exhaust at an air velocity of 1,500 to 2,500 fpm.
C. Where ducts are not self-draining back to equipment, provide low-point drain pocket with the copper drain pipe to a sanitary sewer.
D. Design, fabricate, and install liquidtight preventing exhaust leakage into building.
E. Dishwasher Exhaust Duct:
   1. Duct Size: 1/2 in-wc pressure class stainless steel.
   2. Fabricate using single wall, 20-gauge, 0.035-inch Type 304 stainless steel with external welded joints.
   3. Seal joints during installation with factory-supplied overlapping V-bands and sealant.
F. Kitchen Hood and Grease Exhaust Duct:
   1. Fabricate in accordance with ductwork manufacturer's instructions, SMACNA (DCS), SMACNA (KVS), and NFPA 96.
   2. Zero Clearance, 2-Hour Fire-Rated, Round, Double-Wall, Premanufactured Grease Duct:
   3. Zero Clearance, 2-Hour Fire-Rated, Rectangular, Double-Wall, Premanufactured Grease Duct:
      a. Listed when tested in accordance with UL 1978 and ASTM E2336.
      b. Through-penetration firestop listed to UL 1479 or ASTM E814.
   4. **Kitchen Cooking Hood and Grease Exhaust (field welded)**
      a. Construction:
         1) Steel with minimum thickness of .0575 inch thick (16 gauge) or Stainless Steel not less than .0450 inch thick (18 gauge)
         2) Liquid tight with continuous external weld for all seams and joints.
         3) Where ducts are not self draining back to equipment, provide low point drain pocket with copper drain pipe to sanitary sewer.
      b. Access Doors:
         1) Provide for duct cleaning inside horizontal duct at drain pockets, every 20 feet and at each change of direction.
         2) Use same material and thickness as duct with gaskets and sealants rated 1500 degrees F for grease tight construction.
      c. Insulation:

d. Insulate with grease duct wrap insulation rated for 0" clearance from combustibles per specification 230713.

PART 3 EXECUTION

4.01 INSTALLATION

A. Install, support, and seal ducts in accordance with SMACNA (DCS).
B. Install products following the manufacturer's instructions.
C. During construction, provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering the ductwork system.
D. Flexible Ducts: Not to be used to vent cooking, clothes drying or for supply temperatures exceeding 150 degrees F. Install per ADC Installation standards, fully extended with maximum 15% compression. Provide smooth wall sheet metal fittings for offsets and change of direction. Connect to metal ducts and fittings with liquid adhesive and draw bands. Use no more than 5' of flexible duct for duct runs of 25' or longer. For runs below 25' in total length, flex duct may be used in lieu of rigid, with duct size increased by one duct size (2" additional diameter) larger than size shown on plan.
E. Dryer Exhaust: Provide 4" minimum diameter, and larger where show on plans or required by appliance installation instructions. Where larger ducts are required, vent outlet shall match larger duct size. Provide joints pointed in direction of airflow, support on 4' intervals, and with smooth radius elbows with 6" inside radius, larger if noted. Join without screws or other penetrating fasteners. Flexible transition ducts shall be 6' maximum and shall not be concealed within construction. Where duct is to be concealed within construction, equivalent length shall be permanently posted within 6' of exhaust duct inlet.
F. Provide access panels where drywall ceiling is located below locations where duct access is required (dampers, duct smoke detectors, duct access panels, etc.). Access panel shall match ceiling rating. Refer to architectural specifications for additional requirements.
G. Duct sizes indicated are inside dimensions. For lined ducts, maintain sizes inside lining.
H. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
I. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with a crimp in the direction of airflow.
J. Use double nuts and lock washers on threaded rod supports.
K. At exterior wall louvers, seal duct to louver frame and install blank-out panels.
L. Seal ducts to seal Level A: including transverse joints, longitudinal seams, branch fittings and duct wall penetrations.
   1. Spiral lock seams need not be sealed.
   2. Pressure sensitive tape shall not be used as the primary sealant, unless it has been certified to comply with UL-181A or UL181B by an independent testing laboratory and the tape is used in accordance with that certification.

END OF SECTION

SECTION 23 3300 - AIR DUCT ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air turning devices/extractors.
B. Combination fire and smoke dampers.
C. Combination fire and smoke dampers - corridor dampers.
D. Duct access doors.
E. Control Dampers.
F. Fire dampers.
G. Ceiling Radiation Dampers.
H. Flexible duct connectors.
I. Smoke dampers.
J. Volume control dampers.
K. Miscellaneous Products:
  1. Duct opening closure film.
L. Dryer vent boxes.

1.02 REFERENCE STANDARDS

A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2021.
B. NFPA 92 - Standard for Smoke Control Systems; 2021.
C. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2021.
D. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
E. UL 33 - Safety Heat Responsive Links for Fire-Protection Service; Current Edition, Including All Revisions.
F. UL 555 - Standard for Fire Dampers; Current Edition, Including All Revisions.
G. UL 555S - Standard for Smoke Dampers; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide for shop-fabricated assemblies including volume control dampers, duct access doors, duct test holes, and hardware used. Include electrical characteristics and connection requirements.
C. Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers and duct access doors.
D. Manufacturer's Installation Instructions: Provide instructions for fire dampers and combination fire and smoke dampers.
E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  1. Refer to Division 01 - Product Requirements, for additional provisions.
  2. Extra Fusible Links: One of each type and size.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
C. Products shall comply with fire and smoke rated assembly listing and details as indicated in UL's "Fire Resistance Directory" and with manufacturer's installation instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect dampers from damage to operating linkages and blades.

PART 2 PRODUCTS

2.01 AIR TURNING DEVICES

A. Multi-blade device with 1.5" blade spacing, aligned with airflow; steel construction; with individually adjustable blades, mounting straps.
B. Turning vanes constructed as detailed on plans, otherwise provide single thickness for low velocity (<1000 FPM), and provide double thickness airfoil for medium/high velocity ducts.

2.02 COMBINATION FIRE AND SMOKE DAMPERS

A. Fabricate in accordance with NFPA 90A, UL 555, UL 555S, and as indicated.
B. Provide factory sleeve and collar for each damper.
C. Multiple Blade Dampers: Fabricate with 16 gauge, 0.0598 inch galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, stainless steel jamb seals, 1/8 by 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock, and 1/2 inch actuator shaft.
D. Operators: UL listed and labelled spring return closed - electric power open type. Operator voltage shall match emergency system voltage used to power dampers - either fire alarm NAC panel(s) or 120 volt, single phase, 60 Hz if powered from emergency generator. Provide end switches to indicate damper position. Locate damper operator on interior of duct and link to damper operating shaft.
E. Normally Open Smoke Responsive Fire Dampers: Curtain type, closing upon actuation of electro thermal link, flexible stainless steel blade edge seals to provide constant sealing pressure, stainless steel springs with locking devices to ensure positive closure for units mounted horizontally.
F. Electro Thermal Link: Fusible link melting at 165 degrees F; 120 volts, single phase, 60 Hz; UL listed and labeled.
G. Provide local keyed bypass test switch with LED indicator lights and wiring to damper position switches to indicate damper closure upon local testing.
H. Wiring: Coordinate and subcontract with electrical and fire alarm sub-contractors to include all power wiring, control wiring, smoke detector(s), fire alarm interface and damper installation for a complete working system as approved by the AHJ. Provide wiring from damper position switches to fire alarm system to verify damper closure upon remote

testing. Detector(s) and/or fire alarm interface(s) shall match fire alarm system manufacturer to maintain listing on life safety systems.

2.03 COMBINATION FIRE AND SMOKE DAMPERS - CORRIDOR DAMPERS

A. Fabricate in accordance with NFPA 90A, UL 555, UL 555S, and as indicated.
B. Provide factory sleeve and collar for each damper.
C. Multiple Blade Dampers: Fabricate with 16 gauge, 0.0598 inch galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, stainless steel jamb seals, 1/8 by 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock, and 1/2 inch actuator shaft.
D. Operators: UL listed and labeled; spring-return, electric type suitable for 120 volts, single phase, 60 Hz. Provide end switches to indicate damper position. Locate damper operator on interior of duct and link to damper operating shaft.
E. Normally Open Smoke Responsive Fire Dampers: Curtain type, closing upon actuation of electro thermal link, flexible stainless steel blade edge seals to provide constant sealing pressure, stainless steel springs with locking devices to ensure positive closure for units mounted horizontally.
F. Electro Thermal Link: Fusible link melting at 165 degrees F; 120 volts, single phase, 60 Hz; UL listed and labeled.

2.04 DUCT ACCESS DOORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following.
   1. American Warming and Ventilating.
   2. Ductmate Industries, Inc.
   3. Flexmaster U.S.A., Inc.
   4. Greenheck Fan Corporation.
   5. McGill AirFlow LLC.
   6. Ruskin Company: www.ruskin.com.
   7. Ventfabrics, Inc.
   8. Ward Industries by Commercial Products Group of Hart & Cooley, Inc: www.wardind.com.
B. Fabrication: Rigid and close fitting of galvanized steel with sealing gaskets and quick-fastening locking devices. For insulated ducts, install minimum 1-inch thick insulation with sheet metal cover.
   1. Less Than 12 inches Square: Secure with sash locks.
   2. Up to 18 inches Square: Provide two hinges and two sash locks.
C. Access doors with sheet metal screw fasteners are not acceptable.

2.05 CONTROL DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following.
   1. Greenheck Fan Corporation.
   2. McGill Airflow LLC.
   3. Metalaire, Inc.
   4. Ruskin company.
   5. Young regulator company.
B. Frames:
   1. Hat shaped.
   2. Galvanized-steel channels, 0.064 inch thick.
   3. Mitered and welded corners.
C. Blades:
   1. Multiple blades with maximum blade width of 8 inches.
   2. Opposed-blade design.
   3. Galvanized steel.
   4. 0.064 inch thick.
   5. Blade Edging: Closed-cell neoprene edging.
D. Blade Axles: 1/2-inch-diameter; galvanized steel; blade-linkage hardware of zinc-plated steel and brass; ends sealed against blade bearings.
   1. Operating Temperature Range: From minus 40 to plus 200 deg. F.
E. Bearings:
   1. Oil-impregnated bronz.
   2. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
   3. Thrust bearings at each end of every blade.

2.06 FIRE DAMPERS

A. Type: Dynamic; rated and labeled according to UL 555 by an NRTL.
B. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.
C. Horizontal Dampers: Galvanized steel, 22-gauge, 0.0299-inch frame, stainless steel closure spring, and lightweight, heat-retardant, non-asbestos fabric blanket.
D. Curtain Type Dampers: Galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for horizontal installations. Configure with blades out of air stream except for 1-inch pressure-class ducts up to 12 inches in height.
E. Fusible Links: UL 33, separate at 160 degrees F with adjustable link straps for combination fire/balancing dampers.

2.07 CEILING RADIATION DAMPERS

A. General Requirements: Listed and labeled according to UL 555C by an NRTL for installation into rated structural assembly provided.
B. Manufacturer and installation shall comply with floor-ceiling and roof-ceiling assembly listing and details as indicated in UL's "Fire Resistance Directory" and with manufacturer's instructions.

C. Tested by manufacturer to close with up to 2000 CFM airflow or provide with smoke detection and controls to shut down HVAC equipment blower upon sensing smoke.
D. Frame: 22 guage minimum galvanized sheet steel, round or rectangular, style to suit ceiling construction.
E. Blades: 22 guage minimum galvanized sheet steel with ceramic refractory insulation where larger than 114 square inches.
F. Mounting Orientation: Horizontal.
G. Horizontal Dampers: Include blade lock and stainless-steel closure spring.
H. Heat-Responsive Device: Replaceable, 212 deg F rated fusible links.
I. Fire Rating: Meet or exceed rating of installed floor/ceiling assembly.

2.08 FLEXIBLE DUCT CONNECTORS

A. Fabricate in accordance with SMACNA (DCS) and as indicated.
B. Flexible Duct Connections: Fabric crimped into metal edging strip.
1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz/sq yd.
a. Net Fabric Width: Approximately 2 inches wide.
2. Metal: 3 inches wide, 24 gauge, 0.0239 inch thick galvanized steel.
C. Maximum Installed Length: 14 inch.

2.09 SMOKE DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following.
1. Air Balance Inc.
2. Greenheck Fan Corporation.
3. McGill Airflow LLC.
4. MetalAire, Inc.
5. Prefco.
6. Ruskin Company: www.ruskin.com.
B. Fabricate in accordance with NFPA 90A and UL 555S, and as indicated.
C. Dampers: UL Class 1 airfoil blade type smoke damper, normally closed automatically powered open by electric actuator. Provide end switches to indicate damper position. Locate damper operator on interior of duct and link to damper operating shaft.
D. Electro Thermal Link: Fusible link melting at 165 degrees F; 120 volts, single phase, 60 Hz; UL listed and labeled.
E. Provide local keyed bypass test switch with LED indicator lights and wiring to damper position switches to indicate damper closure upon local testing.
F. Controls: Provide Include control wiring, smoke detector and/or fire alarm interface (as required by AHJ) with damper installation for complete working system. Provide wiring from damper position switches to fire alarm system to confirm damper closure upon remote testing. Coordinate and/or subcontract with the electrical contractor for all required power wiring and raceways. Detector and/or fire alarm interface to match fire alarm system to maintain listing on life safety system.

2.10 DRYER VENT BOXES

A. Manufacturers:
1. American Aldes.
2. Construction Solutions.
3. Dryerbox.
B. UL Classified for one hour wall.
C. Panel and Frame: Minimum thickness 22 guage aluminized steel.

2.11 MISCELLANEOUS PRODUCTS

A. Duct Opening Closure Film: Mold-resistant, self-adhesive film to keep debris out of ducts during construction.
1. Thickness: 2 mils.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate and subcontract with electrical and fire alarm sub-contractors to include all power wiring, control wiring, smoke detector(s), fire alarm interface for complete working systems.
B. Detector(s) and/or fire alarm interface(s) shall match fire alarm system manufacturer to maintain listings on life safety systems.
C. Coordinate power and control voltage, amperage, and other characteristics before selecting and submitting product data.
D. Smoke dampers, combination fire/smoke dampers, and corridor dampers shall include provisions for remote testing by fire alarm system including but not limited to integral position switches.

3.02 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). See Section 23 3100 for duct construction and pressure class.
B. Provide duct access doors for inspection and cleaning at filters, coils, fans, automatic dampers, fire dampers, combination fire and smoke dampers, corridor dampers, smoke dampers and elsewhere as indicated. Provide for cleaning kitchen exhaust ducts in accordance with NFPA 96. Provide minimum 8 by 8 inch size within 12" of moving parts, 18" x 18" size for shoulder access within 12-18" distance, and 24" x 24" size for 18" reach and further, and as indicated. Review locations prior to fabrication.
C. Provide fire dampers, combination fire and smoke dampers, and smoke dampers at locations indicated, where ducts and outlets pass through fire-rated components, and where required by authorities having jurisdiction. Install with

required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.

D. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92.
E. Demonstrate re-setting of fire dampers to Owner's representative.
F. At fans and motorized equipment associated with ducts, provide flexible duct connections immediately adjacent to the equipment.
G. At equipment supported by vibration isolators, provide flexible duct connections immediately adjacent to the equipment.
H. Provide balancing dampers where accessible and at points on supply, return, and exhaust systems where branches are taken from larger ducts for air balancing. Install minimum 2 duct widths from duct take-off.
I. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION

SECTION 23 3423 - HVAC POWER VENTILATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cabinet and ceiling exhaust fans.
B. Ceiling exhaust fans (Energy Star).

1.02 REFERENCE STANDARDS

A. AMCA (DIR) - (Directory of) Products Licensed Under AMCA International Certified Ratings Program; 2015.
B. AMCA 99 - Standards Handbook; 2016.
C. AMCA 204 - Balance Quality and Vibration Levels for Fans; 2020.
D. AMCA Compliance: Products shall comply with air and sound performance requirements and shall be lincensed to use the AMCA-Certified Ratings Seal.
E. AMCA 210 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating; 2016.
F. AMCA 300 - Reverberant Room Method for Sound Testing of Fans; 2014.
G. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; 2014.
H. UL 705 - Power Ventilators; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. Product Data: Provide data on fans and accessories, including fan curves with specified operating point plotted, power, rpm, sound power levels at rated capacity, and electrical characteristics and connection requirements.
B. Manufacturer's Instructions: Indicate installation instructions.
C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project and attic stock.
   1. Refer to Division 01 - Product Requirements, for additional provisions.
   2. Dwelling Unit Bathroom Exhaust Fans: Provide two extra bathroom exhaust fans.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.05 FIELD CONDITIONS

A. Request Owner permission to use permanent ventilator(s) for ventilation during construction.

PART 2 PRODUCTS

2.01 POWER VENTILATORS - GENERAL

A. Static and Dynamically Balanced: Comply with AMCA 204.
B. Performance Ratings: Comply with AMCA 210, bearing certified rating seal.
C. Sound Ratings: Comply with AMCA 301, tested to AMCA 300, bearing certified sound ratings seal.
D. Fabrication: Comply with AMCA 99.
E. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.02 **CABINET AND CEILING EXHAUST FANS**

A. Manufacturers:
B. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on the equipment schedule or a comparable product by one of the following:
   1. Greenheck Fan Corporation: www.greenheck.com.
   2. Loren Cook.
   3. PennBarry, Division of Air System Components: www.pennbarry.com.
   4. Substitutions: Refer to Division 01 - Product Requirements.
C. Centrifugal Fan Unit: V-belt or direct driven with galvanized steel housing lined with acoustic insulation, resiliently mounted motor, gravity backdraft damper in discharge.
D. Disconnect Switch: Cord and plug-in housing for thermal overload protected motor and wall mounted switch.

2.03 CEILING EXHAUST FANS (Energy Star Labeled)

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on equipment schedule or a comparable product by one of the following:
   1. Broan.
   2. Greenheck Fan Corporation.
   3. Loren Cook.
   4. Nutone.
   5. Panasonic.
B. Description: Energy Star Rated, centrifugal fans designed for installing in ceiling or wall for concealed applications.
C. Housing: Steel lined with accoustical insulation.
D. Fan Wheel: Centrifugal wheel directly mounted on motor shaft. Fan shrouds, motor and fan wheel shall be removable for service.
E. Grille: Painted aluminum, louvered grille with flange on intake and thumbscrew attachment to fan housing.
F. Electrical Requirements: Junction box for electrical connection on housing and receptacle for motor plug-in.
G. Accessories:
   1. Ceiling Radiation Damper: Where located in rated assembly, provide with UL-555C rated damper.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Provide backdraft dampers on outlet from cabinet and ceiling exhauster fans and as indicated.

END OF SECTION

SECTION 23 3600 - AIR TERMINAL UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. VVT Zone-Damper System.

1.02 REFERENCE STANDARDS

A. ASTM A492 - Standard Specification for Stainless Steel Rope Wire; 1995 (Reapproved 2019).
B. ASTM A603 - Standard Specification for Metallic-Coated Steel Structural Wire Rope; 2019.
C. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2021.
D. SMACNA (SRM) - Seismic Restraint Manual Guidelines for Mechanical Systems; 2008.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings that indicate airflow, static pressure, and NC designation. Include electrical characteristics and connection requirements.
C. Shop Drawings: Indicate configuration, general assembly, and materials used in fabrication, and electrical characteristics and connection requirements.
D. Manufacturer's Installation Instructions: Indicate support and hanging details, installation instructions, recommendations, and service clearances required.
E. Project Record Documents: Record actual locations of units and locations of access doors required for access of valving.
F. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts lists. Include directions for resetting constant-volume regulators.
G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. Refer to Division 01 - Product Requirements, for additional provisions.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.05 WARRANTY

A. Refer to Division 01 - Closeout Submittals, for additional warranty requirements.
B. Provide five year manufacturer warranty for air terminal units.

PART 2 PRODUCTS

2.01 **VVT ZONE-DAMPER SYSTEM**

A. Manufacturers
    1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on equipment schedule or comparable product by one of the following manufacturers.
    2. Other acceptable manufacturers offering comparable products.
        a. Carrier Corporation.
        b. Johnson, Verasys
        c. Ruskin, Z2000.
        d. Trane VariTrac.
        e. Zonex, System 2000, Gen II.
B. Main Bypass Damper (may be omitted if using VFD controlled blower/changeover VAV RTU).
    1. Bypass Damper Assembly:
        a. Configuration: Air volume damper assembly inside unit casing with control components inside a protective metal shroud.
        b. Volume Damper: Galvanized steel with peripheral gasket and self lubricating bearings.
        c. Casing: Minimum 22 gage galvanized steel.
        d. Blades: 18 gauge galvanized steel opposed blade.
        e. Shaft: 1/2" diameter zinc plated steel with self lubricating nylon bearings.
    2. Bypass Controller: Single enclosure with duct temperature sensor, static pressure sensor, and electronic unit controller to drive the bypass damper actuator to maintain constant system static pressure.
    3. Bypass Damper Operator: Electric Actuator: 24 volt with high limit.
C. Zone Damper.
    1. Zone Damper Assembly:
        a. Configuration: Air volume damper assembly inside unit casing. Locate control components inside protective metal shroud.
        b. Volume Damper: Construct of galvanized steel with peripheral gasket and self lubricating bearings. Maximum damper leakage, 2 percent of design air flow at 1 inches rated inlet static pressure. Mount damper operator to position damper normally open.
        c. Casing: Minimum 22 gage galvanized steel.
        d. Inlet and Outlet: Round stub connections for duct attachment.
    2. Automatic Damper Operator: Electric Actuator: 24 volt with high limit.
D. Zone Sensor: Wall mounted, digital display with limited adjustable temperature settings.
E. Central Control Panel:

1. System level controller coordinates and monitors system operation.
2. Controller monitors time of day schedule, fan mode, heating/cooling mode, system pressure, airflow, supply air temperature, zone temperatures and setpoints, zone logic, economizer operation, and system overide.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Install the inlets of dampers, terminal units and air flow sensors a minimum of four duct diameters from elbows, transitions, and duct takeoffs.
C. Provide ceiling access doors or locate units above easily removable ceiling components.
D. Support units individually from structure with wire rope complying with ASTM A492 and ASTM A603 in accordance with SMACNA (SRM). See Section 23 0548.
E. Do not support from ductwork.
F. Connect to ductwork in accordance with Section 23 3100.
G. Verify that electric power is available and of the correct characteristics.
H. Identify each terminal unit with clearly marked identification label and air flow indicator. Include unit nominal air flow, maximum factory set airflow, minimum factory set air flow, and coil type.

3.02 ADJUSTING

A. Reset volume with damper operator attached to assembly allowing flow range modulation from 100 percent of design flow to zero percent full flow. Set units with heating coils for minimum 50 percent full flow.
B. For zone-damper systems, set programming to maintain system pressure at equipment design, single zone voting based on distance from setpoint, and zone dampers modulating from 100% to 0% flow.

3.03 **FIELD QUALITY CONTROL**

A. Perform test and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections and to assist in testing.
B. Test and Inspections:
   1. After installing air terminal units and after electrical circuitry has been energized, test for compliance with requirements.
   2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
C. Air terminal unit will be considered defective if it does not pass test and inspections.
D. Prepare test and inspection reports.

3.04 **STARTUP SERVICE**

A. Engage a factory-suthorized service representative to perform startup service.
   1. Complete installation and startup checks according to manufacturer's written instructions.
   2. Verify that inlet duct connections are as recommended by air terminal unit manufacturer to achieve proper performance.
   3. Verify that controls and control enclosures are accessible.
   4. Verify that control connections are complete.
   5. Verify that nameplate and identification tag are visible.
   6. Adjust program to show equipment tags and voting down to single zone. Photograph programming screens showing setings and include in O&M manual.
   7. Verify that controls respond to inputs as specified.

3.05 **DEMONSTRATION**

A. Engage a factory-authorized service representative to train owner's maintenance personnel to adjust, operate, and maintain air terminal units.

END OF SECTION

SECTION 23 3700 - AIR OUTLETS AND INLETS

PART 1 GENERAL

1.01 Section Includes
- A. Diffusers:
- B. Rectangular ceiling diffusers.
- C. Registers/grilles:
  - 1. Wall-mounted, exhaust and return register/grilles.
- D. Louvers:
- E. Brick Vents.
- F. Roof hoods.

1.02 Reference Standards
- A. ASHRAE Std 70 - Method of Testing the Performance of Air Outlets and Inlets; 2006 (Reaffirmed 2021).

1.03 Submittals
- A. Refer to Division 01 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

1.04 Quality Assurance
- A. Test and rate air outlet and inlet performance in accordance with ASHRAE Std 70.

PART 2 PRODUCTS

2.01 Manufacturers
- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on equipment schedule or comparable product by one of the following:
  - 1. Hart & Cooley, Inc: www.hartandcooley.com.
  - 2. Krueger: www.krueger-hvac.com.
  - 3. Price Industries: www.price-hvac.com.
  - 4. Titus: www.titus-hvac.com.
  - 5. Tuttle & Bailey.

2.02 RECTANGULAR CEILING DIFFUSERS
- A. Type: Provide square and rectangular, multi-louvered diffuser to discharge air in direction indicated on plans/schedule.
- B. Fabrication: Steel with baked enamel finish.
- C. Color: As indicated.
- D. Accessories: Provide radial opposed blade, butterfly, and combination splitter volume control damper; removable core, sectorizing baffle, safety chain, wire guard, equalizing grid, operating rod extension, anti-smudging device, and gaskets for surface mounted diffusers with damper adjustable from diffuser face.

2.03 **CEILING SUPPLY REGISTERS/GRILLES**
- A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille, two-way deflection.
- B. Frame: 1-1/4 inch margin with countersunk screw mounting and gasket.
- C. Fabrication: Roll-formed steel with factory enamel finish.
- D. Color: As indicated.
- E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face. Provide dampers where specified on schedule.

2.04 **CEILING EXHAUST AND RETURN REGISTERS/GRILLES**
- A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with blades set at 45 degrees, vertical face.
- B. Frame: 1-1/4 inch margin with countersunk screw mounting.
- C. Color: As indicated.
- D. Damper: Integral, gang-operated, opposed blade type with operator, operable from face where not individually connected to exhaust fans. Provide dampers where specified on schedule.

2.05 WALL SUPPLY REGISTERS/GRILLES
- A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille with two-way deflection.
- B. Frame: 1-1/4 inch margin with countersunk screw mounting and gasket.
- C. Color: As indicated.
- D. Damper: Integral, gang-operated, opposed blade type with operator, operable from face. Provide dampers where specified on schedule.

2.06 WALL EXHAUST AND RETURN REGISTERS/GRILLES
- A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with spring or other device to set blades, vertical face.
- B. Frame: 1-1/4 inch margin with countersunk screw mounting.
- C. Color: As indicated on the drawings.
- D. Damper: Integral, gang-operated, opposed blade type with operator, operable from face. Provide damper where specified on schedule.

2.07 **LOUVERS - EXTRUDED, FIXED, DRAINABLE BLADE (opening dimension greater than 16")**
- A. Manufacturers:
  - 1. Greenheck
  - 2. Ruskin Company: www.ruskin.com/#sle.

3. Substitutions: See Section 01 6000 - Product Requirements.

B. Basis-of-Design Product: Subject to compliance with requirements, provide Ruskin model #ELF375DX or comparable product by one of the following.
   1. American Warming and Ventilating Inc.
   2. Greenheck Fan Corporation.
   3. Louvers & Dampers Inc.
   4. Reliabel Products Inc.

C. Type: 4 inch deep with blades on 37.5 degree slope[<>], heavy channel frame, 1/2 inch square mesh screen over exhaust and 1/2 inch square mesh screen over intake.

D. Louver Performance Ratings:
   1. Free Area: Not less than 8.58 sq. ft. for 48-inch-wide by 48-inch-high louver.
   2. Air Performance: Not more than 0.150-inch wg static pressure drop at 873-fpm free area exhaust and intake velocity.

E. Fabrication: 12 gage, 0.1046 inch thick extruded aluminum, welded assembly, with factory prime coat finish.

F. Material: Extruded aluminum, alloy 6063-T5, 0.081 inches thick for frames and blades.

G. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

H. Options: Include removeable / replaceable bug screen.

2.08 BRICK VENTS (Exterior openings 16" dimension or less):

A. Manufacturers: Basis-of-Design Product: Subject to compliance with requirements, provide Greenheck model BVE for masonry and model BVF for siding or comparable product by one of the following.
   1. Greenheck Fan Corporation.
   2. Louvers & Dampers Inc.
   3. Reliable Products.
   4. Ruskin

B. Extruded-aluminum, alloy 6063-T5, louvers and frames not less than 0.100-inch nominal thickness, assembled by welding; with 18-by14-mesh aluminum insect screening on inside face; incorporating weep holes, continuous drip at sill, and integral water stop on inside edge of sill; of load-bearing design and construction.

C. Construction: Brick: depth of 4 inches with 1/8 inch mortar ribs at perimeter (no frame).

D. Construction: Siding: depth of 1.5 inches with frame at face perimeter.

E. Color: Factory primer coat finish, ready for field paint.

F. Blades:
   1. Stype: Straight.
   2. Material: Formed aluminum alloy 6063-T5.
   3. Angle: 48 degrees.
   4. Centers: Blades overlap.

2.09 LOUVERED SHUTTERS - Metal

A. Manufacturers: Basis-of-Design Product: Subject to compliance with requirements, provide In-O-Vate #DWV4_ or equivalent approved product.
   1. Substitutions: Refer to Division 01 - Product Requirements.

B. Construction: 26 gauge galvanized steel body, 30 gauge galvanized steel damper operable to 130 degrees, intrusion prevention magnets, and noise reducing rubber bumpers.

C. Finish: Powder coat finish, color selected by architect.

PART 3 EXECUTION

3.01 Installation

A. Install in accordance with manufacturer's instructions.

B. Check location of outlets and inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.

C. Install diffusers to ductwork with air tight connection.

D. Provide balancing dampers on duct take-off to diffusers and grilles and registers, despite whether dampers are specified as part of diffuser, or grille and register assembly.

E. Paint ductwork visible behind air outlets and inlets matte black, see Section 09 9123.

END OF SECTION

SECTION 23 5400 - FURNACES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Forced air furnaces.
B. Thermostats.

1.02 REFERENCE STANDARDS

A. ANSI Z21.47 - American National Standard for Gas-Fired Central Furnaces; 2021.
B. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
C. ASHRAE Std 103 - Methods of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers; 2017, with Errata (2019).
D. NEMA MG 00001 - Motors and Generators; 2024.
E. NFPA 54 - National Fuel Gas Code; 2021.
F. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2021.
G. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2021.
H. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances; 2019.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
C. Shop Drawings: Indicate assembly, required clearances, and location and size of field connections.
D. Provide manufacturer's approved refrigerant piping schematic: Show layout of refrigerant piping and specialties, including pipe, tube, and fitting sizes, flow capacities, valve arrangements and locations, slopes of horizontal runs, oil traps, double risers, wall and floor penetrations, and equipment connection details. Show interface and spatial relationships between piping and equipment.
    1. Refrigerant piping indicated on Drawings is schematic only. Size piping and design actual piping layout, including oil traps, double risers, Specialties and pipe and tube sizes to Accomodates, as a minimum, equipment provided, elevation difference between compressor and evaporator, and length of piping to ensue proper operation and compliance with warranties of connected equipment.
E. Manufacturer's Instructions: Indicate rigging, assembly, and installation instructions.
F. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
G. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.
H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. See Section 01 6000 - Product Requirements, for additional provisions.
    2. Extra Filters: Two filters. One clean filter upon substantial completion and a spare set.
    3. Provide the following “attic stock” additional product materials at the conclusion of construction for storage on site by the owner:
        a. One (1) box of replacement filters for all HVAC equipment.
        b. Thermostats: Provide two extra thermostats for the dwellin units and one extra for the common spaces.

1.04 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Special Warranty: manufacturers's standard form in which manufacturer agrees to repair or replace the following components of furnaces that fail in materials or workmanship within specified warranty period.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on equipment schedule or a comparable product by one of the following:
    1. Carrier Corporation : www.carrier.com.
    2. Trane Inc. : www.trane.com.
    3. York International Corporation : www.york.com.
    4. Lennox

2.02 GAS FIRED FURNACES

A. Annual Fuel Utilization Efficiency (AFUE): 0.95 ("condensing") in accordance with ASHRAE Std 103.
B. Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating element, controls, air filter, humidifier, and accessories; wired for single power connection with control transformer.
    1. Safety certified by CSA in accordance with ANSI Z21.47.
    2. Venting System: Direct.
    3. Combustion: Sealed.
    4. Heating: Natural gas fired.
    5. Accessories:
        a. Condensate drain.
        b. Concentric roof termination kit.
        c. Concentric wall termination kit.
        d. Condensate drain auxiliary float shut off switch.
C. Air Filters - Dwelling Units: 1 inch thick glass fiber, disposable media with ASHRAE 52.2 MERV rating of 8 or higher in manufacturer's sheet metal frame, arranged for easy replacement Manufacturer's filter box shall be airtight.

D. Air Filters - Common Spaces: 1 inch thick glass fiber, disposable media in manufacturer's frame, arranged for easy replacement. Manufacturer's filter box shall be airtight.
E. Cabinet: Steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner. Leakage shall be certified by manufacturer to be less than 2% of design air flow. If not mounted on steel return plenum, certify for mounting on combustible deck.
F. Primary Heat Exchanger:
   1. Material: Hot-rolled steel.
   2. Shape: Tubular type.
G. Gas Burner:
   1. Atmospheric type with adjustable combustion air supply.
   2. Gas valve, two stage provides 100 percent safety gas shut-off; 24 volt combining pressure regulation, safety pilot, manual set (On-Off), pilot filtration, automatic electric valve.
   3. Electronic pilot ignition, with electric spark igniter.
   4. Combustion air damper with synchronous spring return damper motor.
   5. Non-corrosive combustion air blower with permanently lubricated motor.
H. Gas Burner Safety Controls:
   1. Thermocouple sensor: Prevents opening of gas valve until pilot flame is proven and stops gas flow on ignition failure.
   2. Flame rollout switch: Installed on burner box and prevents operation.
   3. Vent safety shutoff sensor: Temperature sensor installed on draft hood and prevents operation, manual reset.
   4. Limit Control: Fixed stop at maximum permissible setting, de-energizes burner on excessive bonnet temperature, automatic resets.
I. Supply Fan: Centrifugal type rubber mounted with direct drive with adjustable variable pitch motor pulley.
J. Motor:
   1. 1750 rpm single-speed, permanently lubricated, hinge mounted.
K. Operating Controls:
   1. Room Thermostat: Cycles burner to maintain room temperature setting.
   2. Supply Fan Control: Energize from bonnet temperature independent of burner controls, with adjustable timed off delay and fixed timed on delay, with manual switch for continuous fan operation.

2.03 **ELECTRIC FURNACES (AHU)**

A. Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating element, controls, air filter, humidifier, and accessories; wired for single power connection with control transformer.
   1. Air Flow Configuration: Upflow.
   2. Heating: Electric.
B. Cabinet: Steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner. Leakage shall be certified by manufacturer to be less than 2% of design air flow. If not mounted on steel return plenum, certify for mounting on combustible deck.
C. Supply Fan: Centrifugal type rubber mounted with direct drive motor.
D. Motor:
   1. 1750 rpm single-speed, permanently lubricated, hinge mounted.
E. Electric Heater: Helix wound bare nichrome wire heating elements arranged in incremental states of 5 kW each, with porcelain insulators.
F. Electric Heater Operating Controls:
   1. Low voltage programmable room thermostat shall energize heating stages in sequence with pre-determined delay between stages.
   2. Heat pump operation shall use heat pump type thermostat including outdoor air temperature sensor and adaptive learning/resistance heat lockout when heat pump compressor can meet the load.
   3. High limit temperature control de-energizes heating elements, automatic resets.
G. Air Filters - Dwelling Units: 1 inch thick glass fiber, disposable media with ASHRAE 52.2 MERV rating of 8 or higher in manufacturer's sheet metal frame, arranged for easy replacement. Manufacturer's filter box shall be airtight.
H. Air Filters - Common Spaces: 1 inch thick glass fiber, disposable media in manufacturer's sheet metal frame, arranged for easy replacement. Manufacturer's filter box shall be airtight.

2.04 FILTER FRAMES

A. Manufacturers:
   1. Alpine
   2. Winchester
   3. Snappy
   4. Substitutions: See Division 1 for guidelines.
B. Enameled steel assembly containing housing, filter rails, and hinged access door.

2.05 ECONOMIZER DAMPER UNITS

A. Cabinet: Steel with baked enamel finish, easily removed and secured access doors, glass fiber insulation.
B. Dampers: Formed steel with nylon bearings and gaskets.
C. Damper Operators: 24 volt, modulating spring return motor with adjustable minimum position switch.
D. Controls: Room thermostat, return air enthalpy sensor, outdoor air enthaly sensor, discharge air sensor, adjustable DCV / economizer controller, modulating damper actuators, return and outside air control dampers.
E. Provide wiring harness consisting of control board with relays, wiring harness, transformer, and hardware.

2.06 THERMOSTATS

A. Manufacturers: Basis-of-Design Product: Subject to compliance with requirements, provide Honeywell or a comparable product by one of the following:
   1. Carrier Corporation: www.carrier.com.
   2. Trane Inc: www.trane.com.
   3. York International Corporation / Johnson Controls: www.york.com.
   4. Emerson Sensi.
   5. Lennox.
   6. Robertshaw.
   7. White Rodgers.
B. Room Thermostat: Large easy to read digital display, programmable, low voltage, electric solid state microcomputer based room thermostat with remote sensor:
   1. System selector switch (heat-off) and fan control switch (auto-on).
   2. Preferential rate control to minimize overshoot and deviation from setpoint.
   3. Programming based on weekdays, Saturday and Sunday.
   4. Battery replacement without program loss.
   5. Smart capabilities:
      a. Connect to the internet using wi-fi for remote control from a smart phone
      b. Self adjust using learning technologies, resident patterns and ambient conditions
      c. Provide resident access to energy consumption reports
   6. Thermostat Display:
      a. Time of day.
      b. Actual room temperature.
      c. Programmed temperature.
      d. System Mode Indication: Heating, cooling, fan auto, off, and on, auto or on, off.
      e. Verify thermostat compatibility with equipment manufacturer.
   7. Heat pumps shall include outdoor temperature sensing and incremental learning timed switchover to emergency heat.
C. Cover: Where located in public areas, provide locking lexan cover to prevent tampering.
D. Wiring:
   1. Provide wiring according to equipment manufacturer installation instructions and recommendations.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrates are ready for installation of units and openings are as indicated on shop drawings.
B. Verify that proper power supply is available and located correctly.
C. Verify that proper fuel supply is available for connection.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and requirements of authorities having jurisdiction.
B. Install in accordance with NFPA 90A.
C. Install gas fired furnaces in accordance with NFPA 54.
D. Provide vent connections in accordance with NFPA 211.
E. Provide wiring in accordance with Division 26 and NFPA 70.

END OF SECTION

SECTION 23 6213 - PACKAGED AIR-COOLED REFRIGERANT COMPRESSOR AND CONDENSER UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Condensing unit package.
B. Charge of refrigerant and oil.
C. Controls and control connections.
D. Refrigerant piping connections.
E. Motor starters.
F. Electrical power connections.

1.02 REFERENCE STANDARDS

A. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2023.
B. ASHRAE Std 15 - Safety Standard for Refrigeration Systems; 2019, with All Amendments and Errata.
C. ASHRAE Std 23 - Methods for Performance Testing Positive Displacement Refrigerant Compressors and Compressor Units; 2022.
D. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
E. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Submit equipment sizing. Submit matched rated capacities per ARI, weights specialties and accessories, electrical nameplate data, and wiring diagrams. Include equipment served by condensing units in submittal, or submit at same time, to ensure capacities are complementary.
C. Shop Drawings: Submit plans with routing coordinated through walls and structure; Indicate components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections and specialties. Include schematic layouts showing condensing units, cooling coils, refrigerant piping, and accessories required for complete system.
D. Design Data: Indicate pipe and equipment sizing.
E. Manufacturer's Instructions: Submit manufacturer's complete installation instructions and approved refrigerant piping schematic with pipe sizes for lengths to be installed and riser isometric diagrams. Show layout of refrigerant piping and specialties including pipe and fitting sizes, flow capacities, valve arrangements and locations, slopes of horizontal runs, oil traps and double risers for oil management if required.
F. Sustainable Design Documentation: Submit manufacturer's product data on refrigerant used, showing compliance with specified requirements.
G. Operation and Maintenance Data: Include start-up instructions, maintenance instructions, parts lists, controls, and accessories.
H. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.
I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

1.04 QUALITY ASSURANCE

A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

1.06 WARRANTY

A. Provide 1 year maintenance agreement and contractor warranty.
B. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
C. Provide a five year warranty to include coverage for refrigerant compressors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Carrier : www.carrier.com.
B. Trane : www.trane.com.
C. York International Corporation : www.york.com.
D. Lennox
E. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

2.03 MANUFACTURED UNITS

A. Units: Self-contained, packaged, factory-assembled and pre-wired units suitable for outdoor use consisting of cabinet, compressors, condensing coil and fans, integral subcooling coil, controls, liquid receiver, wind deflector, and screens.
B. Construction and Ratings: In accordance with AHRI 210/240. Test in accordance with ASHRAE Std 23.
C. Performance Ratings: Energy Efficiency Rating (EER) and Coefficient of Performance (COP) not less than prescribed by ASHRAE Std 90.1.
D. Refrigerant: Use only refrigerants that have ozone depletion potential (ODP) of zero and global warming potential (GWP) no greater than that allowed by federal code.

2.04 CASING

A. House components in welded steel frame with galvanized steel panels with weather resistant, baked enamel finish.

B. Mount starters, disconnects, and controls in weatherproof panel provided with full opening access doors. Provide mechanical interlock to disconnect power when door is opened.
C. Provide removable access doors or panels with quick fasteners and piano hinges.

2.05 CONDENSER COILS
A. Coils: Aluminum fins mechanically bonded to seamless copper tubing. Provide subcooling circuits. Air test under water to 425 psig, and vacuum dehydrate. Seal with holding charge of nitrogen.
B. Coil Guard: Expanded metal with lint screens.

2.06 FAN REQUIREMENTS
A. Vertical discharge, direct-driven propeller-type condenser fans with fan guard on discharge. Equip with roller or ball bearings with grease fittings extended to outside of casing.
B. Motors as indicated, in compliance with Section 23 0513.

2.07 **COMPRESSORS: Single Stage:**
A. Compressor: Hermetic scroll type.
B. Mounting: Statically and dynamically balance rotating parts.
1. Internally isolate hermetic units on springs.
C. Lubrication System: Reversible, positive displacement oil pump with oil charging valve, oil level sight glass, and magnetic plug or strainer.
D. Motor: Constant speed 1800 rpm suction gas cooled with electronic sensor and winding over temperature protection, designed for across-the-line starting.
1. Furnish with starter, see Section 23 0513.
E. Capacity Reduction Equipment: Suction valve unloaders, with lifting mechanism operated by electrically actuated solenoid valve, with unloaded compressor start; controlled from suction pressure.
F. Sump Oil Heater: Evaporates refrigerant returning to sump during shut down. Energizes heater continuously when compressor is not operating.
G. Low Ambient Kit: Permits operation down to 45 degrees F.

2.08 COMPRESSORS: Two Stage:
A. Compressor: Hermetic scroll type.
B. Mounting: Statically and dynamically balance rotating parts.
1. Internally isolate hermetic units on springs.
2. Refer to Section 22 0548.
C. Lubrication System: Reversible, positive displacement oil pump with oil charging valve, oil level sight glass, and magnetic plug or strainer.
D. Motor: Two speed compressor motor shall have manual-reset high pressure switch and automatic-reset low-pressure switch.
E. Capacity Reduction Equipment: Suction valve unloaders, with lifting mechanism operated by electrically actuated solenoid valve, with unloaded compressor start; controlled from suction pressure.
F. Sump Oil Heater: Evaporates refrigerant returning to sump during shut down. Energize heater continuously when compressor is not operating.
G. Low Ambient Kit: Permits operation down to 30 degrees F.

2.09 REFRIGERANT CIRCUIT
A. For each refrigerant circuit, provide:
1. Filter dryer replaceable core type.
2. Liquid line sight glass and moisture indicator.
3. Thermal expansion valve for maximum operating pressure.
4. Insulated suction line.
5. Suction and liquid line service valves and gauge ports.
6. Liquid line solenoid valve.
7. Charging valve.
8. Compressor discharge service valve.
B. For heat pump units, provide reversing valve, suction line accumulator, discharge muffler, flow control check valve, and solid-state defrost control utilizing thermistors.

2.10 CONTROLS
A. On unit, mount weatherproof steel control panel, NEMA EN 10250, containing power and control wiring, molded case disconnect switch, factory wired with single point power connection.
B. For each compressor, provide across-the-line starter, nonrecycling compressor overload, starter relay, and control power transformer or terminal for controls power. Provide manual reset current overload protection. For each condenser fan, provide across-the-line starter with starter relay.
C. Provide safety controls arranged so any one will shut down machine:
1. High discharge pressure switch (manual reset) for each compressor.
2. Low suction pressure switch (automatic reset) for each compressor.
3. Oil Pressure switch (manual reset).
D. Provide the following operating controls:
1. If building has a BAS system, refer to Section 23 0993.
2. Thermostat located in room cycles compressors activates cylinder unloaders and activates solenoid valves in refrigerant circuit.
3. One minute off timer prevents compressor from short cycling.
4. Periodic pump-out timer to pump down on high evaporator refrigerant pressure.

5. Hot gas bypass sized for minimum compressor loading on one compressor only, bypasses hot refrigerant gas to evaporator.
6. If multiple compressors, provide lead-lag switch to alternate compressor operation.

E. Provide controls to permit operation down to 0 degrees F ambient temperature.
1. Thermostat to cycle fan motors in response to outdoor ambient temperature.
2. Head pressure switch to cycle fan motors in response to refrigerant condensing pressure.
3. Solid state control to vary speed of one condenser fan motor in response to refrigerant condensing pressure.
4. Electronic control consisting of mixing damper assembly, controlled to maintain constant refrigerant condensing pressure.

F. Gauges: Prepiped for suction and discharge refrigerant pressures and oil pressure for each compressor.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's installation instructions.
B. Complete structural, mechanical, and electrical connections in accordance with manufacturer's installation instructions.
C. Provide for connection to electrical service. See Section 26 0583.
D. If located on building structure, mount units on external restrained spring vibration isolators. Refer to Section 23 0548.
E. If located at grade, install units on concrete base as indicated. Through bolt unit interior to concrete slab to prevent theft. Refer to Section 03 3000.
F. Provide flexible connection to refrigeration piping system and evaporators. Refer to Section 23 2300. Comply with ASHRAE Std 15.

3.02 SYSTEM STARTUP

A. Supply initial charge of refrigerant and oil for each refrigeration system. Replace losses of oil or refrigerant prior to end of correction period.
B. Charge system with refrigerant and test entire system for leaks after completion of installation. Repair leaks, put system into operation, and test equipment performance.
C. Have manufacturer's local representative verify installation and accessories are correct and match manufacturer requirements. Document the inspection and sign off and include in Owner and Maintenance manual.
D. Provide cooling season start-up, and winter season shut down for first year of operation.

END OF SECTION

SECTION 23 6423 - SCROLL WATER CHILLERS

PART 2 PRODUCTS

1.01 SCROLL-WATER CHILLER PERFORMANCE REQUIREMENTS

A. Packaged Water-Cooled Chiller, CH-1:

1. Evaporator:

a. Fouling Factor: 0.00010 sq ft-hr-degrees F/Btu.

2. Packaged Water-Cooled Condenser:

a. Fouling Factor: 0.00025 sq ft-hr-degrees F/Btu.

END OF SECTION

SECTION 23 8126.13 - SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air-source heat pumps.
B. Air cooled condensing units.
C. Indoor air handling (fan and coil) units for ductless systems.
D. Controls.

1.02 REFERENCE STANDARDS

A. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2023.
B. AHRI 520 - Performance Rating of Positive Displacement Condensing Units; 2004.
C. ASHRAE Std 23 - Methods for Performance Testing Positive Displacement Refrigerant Compressors and Compressor Units; 2022.
D. ASHRAE Std 15 - Safety Standard for Refrigeration Systems; 2019, with All Amendments and Errata.
E. UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.Include equipment served by condensing units in submittal, or submit at same time, to ensure capacities are complementary.
C. Shop Drawings: Provide plans with routing coordinated through walls and structure. Indicate assembly, required clearances, and location and size of field connections.
D. Design Data: Indicate refrigerant pipe sizing.
E. Manufacturer's Instructions: Indicate rigging, assembly, and installation instructions. Provide manufacturer's approved refrigerant piping schematics indicating refrigerant pipe sizes for lengths to be installed; riser isomentric diagrams; double risers or traps for oil management if required.
F. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
G. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Electrical Components, Devices and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."
C. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6 - "Heating, Ventilating, and Air-Conditioning."

1.05 WARRANTY

A. Refer to Division 01 - Closeout Submittals, for additional warranty requirements.
B. Special Warranty: Manufacturer's standard form on all parts for a period of 1 year from date of installation. The compressor shall have a warranty of 6 years from the date of the original installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on equipment schedule or comparable product by one of the following.
    1. Mitsubishi.
    2. Fujitsu.
    3. Panasonic.

2.02 SYSTEM DESIGN

A. Split-System Heating and Cooling Units: Self-contained, packaged, matched factory-engineered and assembled, pre-wired indoor and outdoor units; UL listed.
    1. Heating and Cooling: Air-source electric heat pump located in outdoor unit with evaporator; auxiliary electric heat.
    2. Provide refrigerant lines internal to units and between indoor and outdoor units, factory cleaned, dried, pressurized and sealed, with insulated suction line.
B. Performance Requirements: See Drawings for additional requirements.

2.03 INDOOR AIR HANDLING UNITS FOR DUCTLESS SYSTEMS

A. Indoor Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, evaporator coil, condensate pump and controls; wired for single power connection with control transformer.
    1. Location: High-wall.
    2. Cabinet: Galvanized steel.
        a. Finish: White.
    3. Fan: Line-flow fan direct driven by a single motor.
B. Evaporator Coils: Copper tube aluminum fin assembly, galvanized or polymer drain pan sloped in all directions to drain, drain connection, refrigerant piping connections, restricted distributor or thermostatic expansion valve.
    1. Construction and Ratings: In accordance with AHRI 210/240 and UL 207.
    2. Manufacturer: System manufacturer.
C. Remote Actuators.
D. Condensate pump.

1. Furnished with equipment by manufacturer capable of pumping maximum condensate flow up to 10' elevation head.

2.04 Outdoor Units

A. Outdoor Units: Self-contained, packaged, pre-wired unit consisting of cabinet, with compressor and condenser.
   1. Comply with AHRI 210/240.
   2. Refrigerant: R-454B.
   3. Construction and Ratings: In accordance with AHRI 210/240 with testing in accordance with ASHRAE Std 23 and UL 207.

B. Compressor: AHRI 520; hermetic, variable speed inverter type, resiliently mounted integral with condenser, with positive lubrication, crankcase heater, high pressure control, motor overload protection, service valves and drier. Provide time delay control to prevent short cycling and rapid speed changes.

C. Air Cooled Condenser: Aluminum fin and copper tube coil, AHRI 520 with direct drive axial propeller fan resiliently mounted, galvanized fan guard.
   1. Condenser Fans: Direct-drive propeller type.
   2. Condenser Fan Motor: Enclosed, 1-phase type, permanently lubricated.

D. Coil: Air-cooled, aluminum fins bonded to copper tubes.

E. Accessories: Filter drier, high-pressure switch (manual reset), low pressure switch (automatic reset), service valves and gauge ports, thermometer well (in liquid line).
   1. Provide thermostatic expansion valves.
   2. Provide heat pump reversing valves.

F. Operating Controls:
   1. Control by room thermostat to maintain room temperature setting.
   2. Low Ambient Kit: Provide refrigerant pressure switch to cycle condenser fan on when condenser refrigerant pressure is above 285 psig and off when pressure drops below 140 psig for operation to 0 degrees F.

G. Mounting Pad: Poured concrete pad, minimum 4 inches thick and extend at least 4 inches beyond unit.

2.05 ACCESSORY EQUIPMENT

A. Room Thermostat: Wall-mounted, large easy to read digital display, electric solid state microcomputer based room thermostat with remote sensor to maintain temperature setting; low-voltage; with following features:
   1. System selector switch (heat-off-cool) and fan control switch (auto-on).
   2. Automatic switching from heating to cooling.
   3. Preferential rate control to minimize overshoot and deviation from setpoint.
   4. Programming based on weekdays, Saturday and Sunday.
   5. Thermostat Display:
      a. Time of day.
      b. Actual room temperature.
      c. Programmed temperature.
      d. Day of week.
      e. System Mode Indication: Heating, Cooling, Fan Auto, Off, and On, Auto or On, Off.
   6. Smart capabilities:
      a. Connect to the internet using wi-fi for remote control from a smart phone.
      b. Self adjust using learning technologies, resident patterns and ambient conditions.
      c. Provide resident access to energy consumption reports.
   7. Manufacturers:
      a. Mitsubishi.
      b. Fujitsu.
      c. Panasonic.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrates are ready for installation of units and openings are as indicated on shop drawings.

B. Verify that proper power supply is available and in correct location.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and requirements of local authorities having jurisdiction.

B. Install refrigeration systems in accordance with ASHRAE Std 15 and manufacturer installation instructions and recommendations.

C. Have manufacturer's local representative verify installation and accessories are correct and match manufacturer requirements. Document the inspection and signoff and include in Owner and Maintenance manual.

D. Pipe drain from condensate outlet to nearest floor drain. Provide with check valve to prevent drainback, and code compliant (plenum rated in return ceiling) drainage tubing to approved receptor.

END OF SECTION

SECTION 23 8200 - CONVECTION HEATING AND COOLING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electric baseboard heaters.
B. Electric unit heaters.
C. Gas unit heaters.
D. Electric wall heaters.
E. Electric ceiling heaters.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide typical catalog of information including arrangements.
C. Shop Drawings:
   1. Indicate cross sections of cabinets, grilles, bracing and reinforcing, and typical elevations.
   2. Submit schedules of equipment and enclosures typically indicating length and number of pieces of element and enclosure, corner pieces, end caps, cap strips, access doors, pilaster covers, and comparison of specified heat required to actual heat output provided.
   3. Indicate mechanical and electrical service locations and requirements.
D. Manufacturer's Instructions: Indicate installation instructions and recommendations.
E. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listings.
F. Warranty: Submit manufacturer's warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements for additional provisions.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.04 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 ELECTRIC BASEBOARD HEATERS

A. Manufacturers: Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on equipment schedule or a comparable product by one of the following:
   1. Chromalox, Inc.
   2. Indeeco.
   3. Markel.
   4. Q-Mark.
B. Provide products listed, classified, and labeled by Underwriters Laboratories Inc. (UL), Intertek (ETL), or testing firm acceptable to authority having jurisdiction as suitable for purpose indicated.
C. Heater Assembly:
D. Heating Elements:
   1. Enclosed nickel chromium wire in steel, stainless steel, or aluminum sheathing or tubing.
   2. Mechanically bonded, aluminum finned, heating elements.
   3. Heating element securely anchored and free-floating for noise free operation.
E. Enclosure Requirements:
   1. General: 24 gauge, 0.0239 inch steel, minimum. Typical for panels, end-caps, corners, joiner pieces, and other related items. Joints to snap together without fasteners.
   2. Service Access Panels: Impact resistant; factory configure for easy removal.
F. Finish:
   1. Factory applied, baked enamel finish.
   2. Color: As indicated on drawings.
G. Controls: Internal bi-metal element thermostat, factory wired.

2.02 ELECTRIC UNIT HEATERS

A. Manufacturers: Basis-of-Design Product: subject to compliance with requirements, provide product indicated on equipment schedule or a comparable product by one of the following:
   1. INDEECO (Industrial Engineering and Equipment Company): www.indeeco.com/#sle.
   2. Chromalox.
   3. Markel Products.
   4. Q-Mark.
B. Provide products listed, classified, and labeled by Underwriters Laboratories Inc. (UL), Intertek (ETL), or testing firm acceptable to authority having jurisdiction as suitable for purpose indicated.
C. Heating Element Assembly:
   1. Thermal safety cut-out within electric terminal box with automatically reset switch located near electric terminal box.
   2. Horizontal Projection Units:
      a. Aluminum fins, copper clad brazed to steel sheath and epoxy sealed for moisture resistance.
      b. Nickel chromium resistance wire surrounded with magnesium oxide and sheathed in steel, spiral-finned tubes.

c. High-mass, all steel tubular type, copper brazed, centrally located and installed in fixed element banks.

D. Housing:
1. Suitable for ceiling or high altitude mount using provided hardware appendages.
2. Horizontal Projection Units:
a. Provide with threaded holes for threaded rod suspension.
b. Provisions for access to internal components for maintenance, adjustments, and repair.

E. Air Inlets and Outlets:
1. Inlets: Provide stamped louvers or protective grilles with fan blade guard.
2. Outlets: Provide diffuser cones, directional louvers, or radial diffusers.

F. Fan: Factory balanced, direct drive, axial type with fan guard.

G. Motor: Totally enclosed, thermally protected, and provided with permanently lubricated bearings.

H. Controls:
1. 24-volt auxiliary relay.

2.03 **ELECTRIC WALL HEATERS**

A. Manufacturers: Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on equipment schedule or a comparable product by one of the following:
1. Berko.
2. Chromalox, Inc.
3. Indeeco.
4. Markel.
5. Q-Mark.

B. Description: An assembly including chassis, electric heating coil, fan, motor, and controls. Comply with UL 2021.

C. Cabinet:
1. Front Panel: Extruded-aluminum bar grille, with removable panels fastened with tamperproof fasteners.
2. Finish: Baked enamel over baked-on primer with manufacturer's standard color selected by Architect, applied to factory-assembled and tested wall and ceiling heaters before shipping.
3. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

D. Surface-Mounting Cabinet Enclosure: Steel with finish to match cabinet.

E. Electric-Resistance Heating Coil: Nickel-chromium heating wire, free from expansion noise and hum, embedded in magnesium oxide refractory and sealed in corrosion-resistant metallic sheath. Terminate elements in stainless-steel, machine-staked terminals secured with stainless-steel hardware, and limit controls for high temperature protection. Provide integral circuit breaker for over current protection.

F. Fan: Aluminum propeller directly connected to motor.
1. Motor: Permanently lubricated. Comply with requirements in Division 23 Section "Common Motor Requirements for HVAC Equipment."

G. Controls: Unit-mounted thermostat.

H. Electrical Connection: Factory wire motors and controls for a single field connection with disconnect switch.

2.04 **ELECTRIC CEILING HEATERS**

A. Manufacturer's: Basis-of-design Product: Subject to compliance with requirements, provide product indicated on equipment schedule or a comparable product by one of the following:
1. Broan.
2. Nutone.
3. Markel Products.
4. Q-Mark Electric Heating.

B. Description: An assembly including chassis, electric heating coil, fan, motor, and controls. Comply with UL 2021.

C. Cabinet:
1. Cover: Expanded-aluminum mesh grille.
2. Finish: Aluminum construction.
3. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

D. Surface-Mounting Cabinet Enclosure: Steel with finish to match cabinet.

E. Electric-resistance Heating Coil: Chrome alloy heating wire, free from expansion noise and hum. Limit controls for high temperature protection.

F. Fan: Aluminum propeller directly connected to motor.

G. Motor: Permanently lubricated.

H. Controls: Remote-mounted line voltage control per equipment schedule.

I. Electrical Connection: Factory wired motor and controls for a single connection, unit shall mount to a standard ceiling electrical box.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are suitable for installation.

3.02 INSTALLATION

A. Install in accordance with manufacturer's recommendations.

B. Install equipment exposed to finished areas after walls and ceilings are finished and painted.

C. Do not damage equipment or finishes.

D. Unit Heaters:
1. Hang from building structure, with pipe hangers anchored to building, not from piping or electrical conduit.

2. Mount as high as possible to maintain greatest headroom unless otherwise indicated.

3.03 CLEANING

A. After construction and painting is completed, clean exposed surfaces of units.

3.04 PROTECTION

A. Provide finished cabinet units with protective covers during the balance of construction.

END OF SECTION

SECTION 26 0050 - ELECTRICAL EXECUTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Definitions.
   2. Coordination.
   3. Common electrical installation requirements.

1.02 RELATED DOCUMENTS

A. Drawings, General Provisions of the Contract, including General Conditions, Supplementary General Conditions, other Division 00 & 01 Specification Sections, shall apply to this division.

B. These requirements apply to all work in Divisions 26, 27 and 28.

1.03 DEFINITIONS

A. "Approved" means approved by the Engineer and Owner.

B. "Furnish" means to purchase, arrange for delivery to site, and to take delivery at the site.

C. "Install" means to place in position for use.

D. "Provide" means to furnish and install.

E. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.

F. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters, overhangs and attics.

G. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

H. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

I. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

1.04 COORDINATION

A. Coordination: Coordinate construction operations to ensure efficient and orderly installation of the Work.
   1. Coordinate construction operations, that depend on each other for proper installation, connection, and operation.
   2. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   3. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
   4. Make adequate provisions to accommodate items scheduled for later installation.
   5. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Construction Schedule.
   2. Preparation of the Schedule of Values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Preinstallation conferences.
   7. Project closeout activities.
   8. Startup and adjustment of systems.
   9. Project closeout activities.

1.05 PROJECT MEETINGS

A. General: Attend meetings and conferences at Project site, unless otherwise indicated.
   1. Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Engineer of scheduled meeting dates and times.
   2. Agenda: Request the meeting agenda if not furnished prior to meeting.
   3. Minutes: Record significant discussions and agreements achieved. Request the meeting minutes if not furnished. Note all discrepancies and notify Engineer of all changes to the Work or to the Contract Documents.

B. Preconstruction Conference: Attend the preconstruction conference before starting construction, no later than 15 days after execution of the Agreement to review responsibilities and personnel assignments.
   1. Attendees: Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: Discuss items of significance that could affect progress, including the following as applicable:
      a. Tentative construction schedule.

b. Phasing.
c. Critical work sequencing and long-lead items.
d. Designation of key personnel and their duties.
e. Procedures for processing field decisions and Change Orders.
f. Procedures for requests for interpretations (RFIs).
g. Procedures for testing and inspecting.
h. Procedures for processing Applications for Payment.
i. Distribution of the Contract Documents.
j. Submittal procedures.
k. LEED requirements.
l. Preparation of Record Documents.
m. Use of the premises.
n. Work restrictions.
o. Owner's occupancy requirements.
p. Responsibility for temporary facilities and controls.
q. Construction waste management and recycling.
r. Parking availability.
s. Office, work, and storage areas.
t. Equipment deliveries and priorities.
u. First aid.
v. Security.
w. Progress cleaning.
x. Working hours.

C. Preinstallation Conferences: Attend a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following as applicable:
a. The Contract Documents.
b. Options.
c. Related requests for interpretations (RFIs).
d. Related Change Orders.
e. Purchases, deliveries, submittals.
f. Review of mockups.
g. Possible conflicts.
h. Compatibility problems.
i. Time schedules.
j. Weather limitations.
k. Manufacturer's written recommendations.
l. Warranty requirements.
m. Compatibility of materials.
n. Acceptability of substrates.
o. Space and access limitations.
p. Regulations of authorities having jurisdiction.
q. Testing and inspecting requirements.
r. Installation procedures.
s. Coordination with other work.
t. Required performance results.
u. Protection of adjacent work.
v. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present, to parties who should have been present, and to the Engineer.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

1.06 SUBMITTALS

A. Alternate Products: Alternate manufacturers, equipment and/or products must be specified or approved prior to bid in writing via addendum to be accepted. All costs associated with deviations from the basis of design shall be borne by the contractor. Deviations shall include alternate manufacturer and/or alternate product and shall include all significant dimensional, performance, electrical, or installation differences from the basis of design products. Costs for reimbursement shall include the costs of other trades affected, and shall include all engineering costs to evaluate such deviations.

B. Substitutions: Unspecified manufacturers shall be considered substitutions and shall be submitted for consideration under the specified substitution procedures. Substitutions shall be submitted to the engineer for evaluation. If

approved by the engineer, substitution shall be offered to the owner for consideration. All costs associated with substitutions shall be borne by the contractor. Costs for reimbursement shall include the costs of other trades affected, and shall include all engineering costs to evaluate such deviations.

C. Coordination Drawings: Prepare Coordination Drawings (coordinated shop drawings) to maximize utilization of space for efficient installation of different components and for installation of products and materials fabricated by separate entities. Submit to Engineer for review before starting work.
   1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
      a. Indicate functional and spatial relationships of components of the work with all other systems and trades.
      b. Indicate required installation sequences.
      c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide sketches of proposed alternate construction to Engineer for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

D. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project. Submit to Engineer before starting work.
   1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

E. Make all necessary field measurements and investigations to assure that the equipment and assemblies will meet contract requirements.

F. If equipment is submitted which differs in arrangement from that shown, provide drawings that show the rearrangement of all associated systems. Approval will be given only if all features of the equipment and associated systems, including accessibility, are equivalent to that required by the contract.

G. Prior to submitting shop drawings for review, contractor shall certify in writing that manufacturers of all major items of equipment have each reviewed drawings and specifications, and have jointly coordinated and properly integrated their equipment and controls to provide a complete and efficient installation.

1.07 Warranties

A. All work shall include a parts and labor warranty on materials and workmanship for a period of 1 year.

B. Refer to Division 01 for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURED CURBS

A. Manufactured Curbs, Equipment Rails, and Other Roof Mounting Assemblies:
   1. The Pate Company: www.patecurbs.com.
   2. Substitutions: Refer to Division 01 - Product Requirements.

B. General requirements: Factory-assembled hollow sheet metal construction with fully mitered and welded corners, integral counterflashing, internal reinforcing, and top side and edges formed to shed water.
   1. Sheet Metal: Hot-dip zinc coated steel sheet complying with ASTM A653/A653M, SS Grade 33; G60 coating designation; 18 gage, 0.048 inch thick.
   2. Roofing Cants: Provide integral sheet metal roofing cants dimensioned to begin slope at top of roofing insulation; 1:1 slope; minimum cant height 4 inches.
   3. Manufacture curb bottom and mounting flanges for installation directly on roof deck, not on insulation; match slope and configuration of roof deck.
   4. Provide the layouts and configurations shown on the drawings.

C. Equipment Rails: Two-sided curbs in straight lengths, with top horizontal for equipment mounting.
   1. Provide preservative treated wood nailers along top of rails.
   2. Height Above Finished Roof Surface: 6 inches, minimum.
   3. Height Above Roof Deck: 14 inches, minimum.

D. Pipe, Duct, and Conduit Mounting Pedestals: Vertical posts, minimum 8 inches square unless otherwise indicated.
   1. Provide preservative treated wood nailers over entire top surface, for supports to be provided by others.
   2. Height Above Finished Roof Surface: 12 inches, minimum.
   3. Height Above Roof Deck: 14 inches, minimum.

2.02 SLEEVES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop and 1% outward slope, unless otherwise indicated.

C. Sleeves for Rectangular Openings: Galvanized sheet steel.
   1. Minimum Metal Thickness:
      a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
      b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."

2.03 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
   1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
   2. Design Mix: 5000-psi, 28-day compressive strength.
   3. Packaging: Premixed and factory packaged.

2.04 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
B. Sealing Elements: EPDM or NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
C. Pressure Plates: Steel. Include two for each sealing element.
D. Connecting Bolts and Nuts: Steel with corrosion-resistant coating or stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.
E. Do not use "Thum-Gum" and other similar materials/products, as a sealant at wall/ceilings shall not be used.

2.05 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.
B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.
C. One-Piece, Cast-Brass Type: With set screw.
   1. Finish: Polished chrome-plated.
D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
   1. Finish: Polished chrome-plated.

PART 3 EXECUTION

3.01 ELECTRICAL DEMOLITION

A. Refer to Division 01 Section "Cutting and Patching" and Division 02 Section "Selective Structure Demolition" for general demolition requirements and procedures.
B. Contractor shall be responsible for all work and costs associated with demolition shown or noted on plans.
C. Verify exact requirements before bid and include direct and related indirect costs in estimate including permit application, fees, dust control, protection of existing, temporary power, fuel usage, scaffolding, disconnection, disposal, cutting and patching.
D. Occupied Buildings: For occupied buildings, coordinate with local management for communication with building users, occupants, and/or residents regarding potential for disruption, and provide 72 hour advance notification for planned outages. Install new work to the fullest extent possible before interrupting existing services to minimize disruption to residents. Provide temporary power for disruptions lasting over 15 minutes. Assume (midnight to 4am) premium labor rates for power shutdown, changeover and reconnection.
E. In performing the work:
   1. Coordinate with existing conditions and other trades before starting work.
   2. Remove portions of walls, floors, ceilings, etc. required for access to demolished and new work.
   3. Disconnect, demolish, and remove systems, equipment, and components indicated to be removed.
   4. Conduit/Wire to Be Removed: Remove portion indicated to be removed and cap or plug remaining with same or compatible material.
   5. Conduit/Wire Abandoned in Place: Cap or plug with compatible material.
   6. Equipment to Be Removed: Disconnect electrical power. Disconnect and cap services and remove equipment. Remove related supports, anchorages, and concrete bases.
   7. Equipment to Be Removed and Reinstalled: Arrange for disconnection of electrical power. Disconnect and cap services and remove, clean, and store equipment. When appropriate, reinstall, reconnect, arrange for power connection and make equipment operational.
   8. Equipment to Be Removed and Salvaged: Arrange for disconnection of electrical power. Disconnect and cap services, remove equipment and deliver to Owner.
F. If new or existing to remain products are damaged during demolition, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.
G. Subcontract the General Contractor to perform patching, repair or replacement of walls floors, ceilings, etc. removed for access to the work. General contractor shall repair finishes to match surrounding finishes.

3.02 COMMON REQUIREMENTS

A. Install according to requirements and other Division specification sections.
B. Drawing plans, schematics, and diagrams indicate general location and arrangement of systems. Indicated locations and arrangements were used for sizing, calculations and other design considerations. Install as indicated unless deviations to layout are approved on Coordination Drawings.
C. Install circuits in concealed locations, unless otherwise indicated and except in equipment rooms and service areas. Where located within walls and other concealed areas subject to damage, provide suitable protection.
D. Conduits indicated to be exposed and piping in equipment rooms and service areas shall be at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
E. Install conduits through (preferred) or tight to structure (if approved by architect). If above accessible ceiling, allow sufficient space for ceiling panel removal.
F. Materials exposed within plenums shall be noncombustible or have a flame spread index of 25 or less and a smoke-developed index of 50 or less.
G. Install circuits and disconnects to permit servicing.
H. Install conduits free of sags and bends.

I. Install boxes for changes in direction and branch connections.
J. Install circuits to allow application of insulation.
K. Select system components with voltage rating equal to or greater than system operating voltage.
L. Install escutcheons for penetrations of walls, ceilings, and floors.
M. Comply with NECA 1 and NECA 100. Provide all work plumb, level, and in workmanlike manner.
N. Provide corrosion protection for all work (equipment, conduits, supports, and fasteners) located in exterior, underground, or damp environments.
O. Headroom Maintenance: Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items. If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
P. Right of Way: Give to piping systems installed at a required slope.

3.03 PENETRATIONS

A. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.
B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls. Sleeve ends shall be flush with both wall surfaces unless otherwise noted. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Concrete and masonry penetrations: seal space outside of sleeves with grout. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
C. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
D. Roof-Penetrations: Penetrations shall use premanufactured pipe curbs fastened to deck with insulation and roofing membrane applied by roofing contractor. Seal penetrations into curb with flexible boots, with sealant between pipe and boot with pipe clamp for compression around perimeter.
E. Aboveground, Exterior-Wall Pipe Penetrations: Position pipe in center of sleeve. Maintain 1% outward slope, unless otherwise indicated. Seal penetrations using non-expanding foam. After cured, trim flush, and cover with trim or escutcheon (paint ILO trim only if specifically approved by architect representative).
F. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.
G. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors. Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07. "Comply with requirements in Division 07."
H. Apply firestopping to penetrations of fire and/or smoke rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07.
I. Penetrations of membranes of rated walls shall be protected by UL listed products. Coordinate exact installation conditions with selected fire sealants supplier. For penetrations which do not have a standard UL installation detail, arrange for engineering determination from sealant supplier and/or manufacturer and provide modifications required to match detail.

3.04 **INSTALLATION - COMMON REQUIREMENTS**

A. Install equipment, fixtures, devices, wiring and specialties according to manufacturer installation instructions and recommendations.
B. Refer to other Sections of these Specifications for additional requirements.
C. Install to allow maximum possible headroom unless specific mounting heights are indicated.
D. Install work level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
E. Install work to facilitate service, maintenance, and repair or replacement of components. Connect work for ease of disconnecting, with minimum interference to other installations. Install work to allow maximum possible headroom unless specific mounting heights are not indicated.
F. Install work to allow right of way for piping installed at required slope.
G. Contact equipment manufacturer's representative to visit site and observe installation in order to confirm installation requirements and warranty coverage. Document observation in writing and include in O&M manuals.
H. Provide service and maintenance for not less than one year from the Date of Substantial Completion or for the warranty period specified in Division 01, whichever is longer. Refer to Division 01 for additional service and requirements.

3.05 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
   1. Provide concrete bases which are plumb, level and fully supported to prevent shifting over time.
   2. Provide concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
   3. Place and secure anchorage devices. Install according to equipment manufacturer's recommendations, setting drawings, templates, diagrams, instructions, and directions for supported equipment. Provide anchor bolts according to anchor-bolt manufacturer's written instructions. Install anchor bolts to elevations required for proper attachment to supported equipment. Unless otherwise noted, install epoxy-coated anchor bolts to match equipment that extend through concrete base, and anchor into structural concrete.

4. Where located on structural floor, provide dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of the base.
5. Provide 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section "Cast-in-Place Concrete."

3.06 SUPPORTS AND ANCHORAGES

A. Provide supports to match construction type and adjacent assembly rating.
B. For combustible construction, provide wood supports and anchorages. Cut, fit, and place nailers, blocking, and anchorages to support, and anchor materials and equipment. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
C. For non-combustible building construction provide metal supports and anchorages. Refer to Division 05 Section "Metal Fabrications" for structural steel. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment. Field Welding shall comply with AWS D1.1.
D. Attach to substrates to support applied loads.

3.07 GROUTING

A. Clean surfaces that will come into contact with grout. Provide forms for placement of grout.
B. Mix and install grout for equipment base bearing surfaces, and anchors.
C. Place grout around anchors and completely filling equipment base and provide smooth bearing surface for equipment. Avoid air entrapment during placement of grout.
D. Allow grout to cure before loading or applying forces.

3.08 SLEEVE-SEAL INSTALLATION

A. Install to seal below-grade exterior wall penetrations.
B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

END OF SECTION 260500

SECTION 26 0519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Single conductor building wire.
B. Nonmetallic-sheathed cable.
C. Underground feeder and branch-circuit cable.
D. Service entrance cable.
E. Armored cable.
F. Metal-clad cable.
G. Manufactured wiring systems.
H. Wiring connectors.
I. Electrical tape.
J. Heat shrink tubing.
K. Oxide inhibiting compound.
L. Wire pulling lubricant.

1.02 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2018).
B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2011 (Reapproved 2017).
C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).
D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).
E. ASTM B800 - Standard Specification for 8000 Series Aluminum Alloy Wire for Electrical Purposes - Annealed and Intermediate Tempers; 2005 (Reapproved 2021).
F. ASTM B801 - Standard Specification for Concentric-Lay-Stranded Conductors of 8000 Series Aluminum Alloy for Subsequent Covering or Insulation; 2018.
G. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2017.
H. ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes; 2020.
I. FS A-A-59544 - Cable and Wire, Electrical (Power, Fixed Installation); 2008a (Validated 2019).
J. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
K. NECA 104 - Standard for Installing Aluminum Building Wire and Cable; 2012.
L. NECA 120 - Standard For Installing Armored Cable (Type AC) And Metal-Clad Cable (Type MC); 2018.
M. NECA 121 - Standard for Installing Nonmetallic-Sheathed Cable (Type NM-B) and Underground Feeder and Branch-Circuit Cable (Type UF); 2007.
N. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2021.
O. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2017.
P. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
Q. UL 4 - Armored Cable; Current Edition, Including All Revisions.
R. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.
S. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.
T. UL 183 - Manufactured Wiring Systems; Current Edition, Including All Revisions.
U. UL 267 - Outline of Investigation for Wire-Pulling Compounds; Most Recent Edition, Including All Revisions.
V. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.
W. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.
X. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.
Y. UL 493 - Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables; Current Edition, Including All Revisions.
Z. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.
AA. UL 719 - Nonmetallic-Sheathed Cables; Current Edition, Including All Revisions.
BB. UL 854 - Service-Entrance Cables; Current Edition, Including All Revisions.
CC. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
   2. Coordinate the installation of direct burial cable with other trades to avoid conflicts with piping or other potential conflicts.
   3. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
   4. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.
C. Design Data: Indicate voltage drop and ampacity calculations for aluminum conductors substituted for copper conductors. Include proposed modifications to raceways, boxes, wiring gutters, enclosures, etc. to accommodate substituted conductors.
D. Field Quality Control Test Reports.
E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
F. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing for underground circuits.

1.05 QUALITY ASSURANCE
A. Comply with requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

1.07 FIELD CONDITIONS
A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect and obtain direction before proceeding with work.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS
A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
C. Nonmetallic-sheathed cable is permitted only as follows:
1. Where not otherwise restricted, may be used:
a. For branch circuit wiring in dry locations within one- and two-family dwellings and their attached or detached garages, and their storage buildings.
b. For branch circuit wiring in dry locations within multifamily dwellings permitted to be of Types III, IV, and V construction.
2. In addition to other applicable restrictions, may not be used:
a. Where exposed to view.
b. Above suspended ceilings.
c. Where exposed to damage.
d. For damp, wet, or corrosive locations.
D. Underground feeder and branch-circuit cable is permitted only as follows:
1. Where not otherwise restricted, may be used:
a. For damp, wet, or corrosive locations as a substitute for NFPA 70, Type NMC nonmetallic-sheathed cable, when nonmetallic-sheathed cable is permitted.
2. In addition to other applicable restrictions, may not be used:
a. Where exposed to view.
b. Where exposed to damage.
E. Service entrance cable is permitted only as follows:
1. Where not otherwise restricted, may be used:
a. For overhead service drop, installed in raceway from service head.
b. For underground service entrance, installed in raceway only if USE rated.
2. In addition to other applicable restrictions, may not be used:
a. Where exposed to damage.
F. Armored cable is permitted only as follows:
1. Where not otherwise restricted, may be used:
a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
1) Maximum Length: 6 feet.
b. Where concealed in hollow stud walls, above accessible ceilings, and under raised floors for branch circuits up to 20 A.
1) Exception: Provide single conductor building wire in raceway for circuit homerun from first outlet to panelboard.
c. For general purpose, non-essential electrical systems in non-hazardous patient care areas of health care facilities, when provided with additional insulated grounding conductor for redundant grounding.
2. In addition to other applicable restrictions, may not be used:
a. Unless approved by Owner.
b. Where not approved for use by the authority having jurisdiction.
c. Where exposed to view.
d. Where exposed to damage.
e. For damp, wet, or corrosive locations.
f. For isolated ground circuits.

G. Metal-clad cable is permitted only as follows:
  1. Where not otherwise restricted, may be used:
    a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
      1) Maximum Length: 6 feet.
    b. Where concealed in hollow stud walls, above accessible ceilings, and under raised floors for branch circuits up to 20 A.
      1) Exception: Provide single conductor building wire in raceway for circuit homerun from first outlet to panelboard.
  2. In addition to other applicable restrictions, may not be used:
    a. Unless approved by Owner.
    b. Where not approved for use by the authority having jurisdiction.
    c. Where exposed to view.
    d. Where exposed to damage.
    e. For damp, wet, or corrosive locations, unless provided with a PVC jacket listed as suitable for those locations.
    f. For isolated ground circuits, unless provided with an additional isolated/insulated grounding conductor.
    g. For patient care areas of health care facilities requiring redundant grounding.
H. Emergency systems shall include the following restrictions:
  1. Wiring shall remain entirely separate from other wiring and shall use entirely separate equipment, raceways and junction boxes.
  2. Feeder wiring shall use fire resistive cables:
    a. Products shall be listed under category FHJR and installed according to the listing.
    b. Other means and methods may be used if permitted by code as determined by the AHJ.
I. Manufactured wiring systems are permitted only as follows:
  1. Where not otherwise restricted, may be used:
    a. For branch circuits where concealed above accessible ceilings for lighting.
    b. For general purpose, non-essential electrical systems in non-hazardous patient care areas of health care facilities, when provided with additional insulated grounding conductor for redundant grounding.
  2. In addition to other applicable restrictions, may not be used:
    a. Unless approved by Owner.
    b. Where not approved for use by the authority having jurisdiction.
    c. Where exposed to view.
    d. Where exposed to damage.
    e. For damp, wet, or corrosive locations.
    f. For isolated ground circuits, unless provided with an additional isolated/insulated grounding conductor.

2.02 CONDUCTOR AND CABLE MANUFACTURERS
A. Cerro Wire LLC: www.cerrowire.com.
B. Encore Wire Corporation: www.encorewire.com.
C. Southwire Company: www.southwire.com.
D. Substitutions: Refer to Division 01 - Product Requirements.

2.03 CONDUCTOR AND CABLE GENERAL REQUIREMENTS
A. Provide products that comply with requirements of NFPA 70.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Provide new conductors and cables manufactured not more than one year prior to installation.
D. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. for a complete operating system.
E. Comply with NEMA WC 70.
F. Comply with FS A-A-59544 where applicable.
G. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
H. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
I. Conductors for Grounding and Bonding: Also comply with Section 26 0526.
J. Conductors and Cables Installed Where Exposed to Direct Rays of Sun: Listed and labeled as sunlight resistant.
K. Conductors and Cables Installed Exposed in Spaces Used for Environmental Air (only where specifically permitted): Plenum rated, listed and labeled as suitable for use in return air plenums.
L. Conductor Material:
  1. Provide copper conductors except where aluminum conductors are specifically indicated or permitted for substitution. Conductor sizes indicated are based on copper unless specifically indicated as aluminum. Conductors designated with the abbreviation "AL" indicate aluminum.
    a. Substitution of aluminum conductors for copper is permitted, when approved by Owner and authority having jurisdiction, only for the following:
      1) Services: Copper conductors size 6 AWG and larger.
      2) Feeders: Copper conductors size 6 AWG and larger.
    b. Where aluminum conductors are substituted for copper, comply with the following:
      1) Size aluminum conductors to provide, when compared to copper sizes indicated, equivalent or greater ampacity and equivalent or less voltage drop.
      2) Increase size of raceways, boxes, wiring gutters, enclosures, etc. to accommodate aluminum conductors.
      3) Provide aluminum equipment grounding conductor sized according to NFPA 70.

4) Equip electrical distribution equipment with compression lugs for terminating aluminum conductors.
2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
3. Tinned Copper Conductors: Comply with ASTM B33.
4. Aluminum Conductors (only where specifically indicated or permitted for substitution): AA-8000 series aluminum alloy conductors recognized by ASTM B800 and compact stranded in accordance with ASTM B801 unless otherwise indicated.

M. Minimum Conductor Size:
1. Branch Circuits: 14 AWG permitted only for 15 Amp branch circuits less than 50 feet in length. Otherwise, 12 AWG conductors shall be used.
a. Exceptions:
1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.
2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
3) 20 A, 277 V circuits longer than 150 feet: 10 AWG, for voltage drop.
2. Control Circuits: 14 AWG.

N. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

O. Conductor Color Coding:
1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
2. Color Coding Method: Integrally colored insulation.
a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.
3. Color Code:
a. 208Y/120 V, 3 Phase, 4 Wire System:
1) Phase A: Black.
2) Phase B: Red.
3) Phase C: Blue.
4) Neutral/Grounded: White.
b. 240/120 V, 1 Phase, 3 Wire System:
1) Phase A: Black.
2) Phase B: Red.
3) Neutral/Grounded: White.
c. Equipment Ground, All Systems: Green.
d. Travelers for 3-Way and 4-Way Switching: Pink.
e. For control circuits, comply with manufacturer's recommended color code.

2.04 SINGLE CONDUCTOR BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor Stranding:
1. Feeders and Branch Circuits:
a. Size 10 AWG and Smaller: Solid.
b. Size 8 AWG and Larger: Stranded.
2. Control Circuits: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation:
1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
2. Aluminum Building Wire (only where specifically indicated or permitted for substitution): Type XHHW-2.

2.05 NONMETALLIC-SHEATHED CABLE

A. Description: NFPA 70, Type NM multiple-conductor cable listed and labeled as complying with UL 719, Type NM-B.

B. Conductor Stranding:
1. Size 10 AWG and Smaller: Solid.
2. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

2.06 UNDERGROUND FEEDER AND BRANCH-CIRCUIT CABLE

A. Description: NFPA 70, Type UF multiple-conductor cable listed and labeled as complying with UL 493, Type UF-B.

B. Provide equipment grounding conductor unless otherwise indicated.

C. Conductor Stranding:
1. Size 10 AWG and Smaller: Solid.
2. Size 8 AWG and Larger: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Cable Jacket: Listed and labeled as sunlight resistant.

2.07 SERVICE ENTRANCE CABLE

A. Service Entrance Cable for Above-Ground Use: NFPA 70, Type SE multiple-conductor cable listed and labeled as complying with UL 854, Style R.

B. Service Entrance Cable for Underground Use: NFPA 70, Type USE single-conductor cable listed and labeled as complying with UL 854, Type USE-2 and with UL 44 Type RHH/RHW-2.

C. Conductor Stranding: Stranded.

D. Insulation Voltage Rating: 600 V.

2.08 ARMORED CABLE

A. Description: NFPA 70, Type AC cable listed and labeled as complying with UL 4, and listed for use in classified firestop systems to be used.

B. Conductor Stranding:

1. Size 10 AWG and Smaller: Solid.
2. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation: Type THHN.

E. Grounding: Combination of interlocking armor and integral bare bonding wire.

F. Armor: Steel, interlocked tape.

2.09 METAL-CLAD CABLE

A. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.

B. Conductor Stranding:

1. Size 10 AWG and Smaller: Solid.
2. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.

E. Grounding: Full-size integral equipment grounding conductor.

F. Armor: Steel, interlocked tape.

G. Provide PVC jacket applied over cable armor.

2.10 MANUFACTURED WIRING SYSTEMS

A. Description: Manufactured wiring assemblies complying with NFPA 70 Article 604, and listed and labeled as complying with UL 183.

B. Provide components necessary to transition between manufactured wiring system and other wiring methods.

C. Branch Circuit Cables:

1. Conductor Stranding (Size 10 AWG and Smaller): Solid.
2. Insulation Voltage Rating: 600 V.
3. Insulation: Type THHN.
4. Grounding: Full-size integral equipment grounding conductor.
5. Armor: Steel, interlocked tape.

D. Connectors: Keyed and color-coded to prevent interconnection of different voltages.

E. Fixture Leads: Type TFN insulation.

2.11 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Connectors for Grounding and Bonding: Comply with Section 26 0526.

C. Wiring Connectors for Splices and Taps:

1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
3. Connectors for Aluminum Conductors: Use compression connectors.

D. Wiring Connectors for Terminations:

1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
4. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
5. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
6. Aluminum Conductors: Use compression connectors for all connections.
7. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.
8. Conductors for Control Circuits: Use crimped terminals for all connections.

E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.

F. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.

G. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.

H. Mechanical Connectors: Provide bolted type or set-screw type.

I. Compression Connectors: Provide circumferential type or hex type crimp configuration.

J. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.

2.12 ACCESSORIES

A. Electrical Tape:

1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
    a. Substitutions: See Section 01 6000 - Product Requirements.
2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
3. Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil; suitable for continuous temperature environment up to 194 degrees F and short-term 266 degrees F overload service.
4. Electrical Filler Tape: Rubber-based insulating moldable putty, minimum thickness of 125 mil; suitable for continuous temperature environment up to 176 degrees F.
5. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.

B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
C. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.
D. Wire Pulling Lubricant:
1. Listed and labeled as complying with UL 267.
2. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
3. Suitable for use at installation temperature.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.
B. Verify that work likely to damage wire and cable has been completed.
C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
D. Verify that field measurements are as indicated.
E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

A. Circuiting Requirements:
1. Unless dimensioned, circuit routing indicated is diagrammatic.
2. When circuit destination is indicated without specific routing, determine exact routing required.
3. Arrange circuiting to minimize splices.
4. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
5. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is not permitted.
    a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
    b. Increase size of conductors to account for ampacity derating.
    c. Size raceways, boxes, etc. to accommodate conductors.
6. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.
    a. Branch circuits fed from ground fault circuit interrupter (GFCI) circuit breakers.
    b. Branch circuits fed from feed-through protection of GFI receptacles.
    c. Branch circuits with dimming controls.
    d. Branch circuits with isolated grounding conductor.

B. Install products in accordance with manufacturer's instructions.
C. Perform work in accordance with NECA 1 (general workmanship).
D. Install aluminum conductors in accordance with NECA 104.
E. Install nonmetallic-sheathed cable (Type NM-B) in accordance with NECA 121.
F. Install underground feeder and branch-circuit cable (Type UF-B) in accordance with NECA 121.
G. Install armored cable (Type AC) in accordance with NECA 120.
H. Install metal-clad cable (Type MC) in accordance with NECA 120.
I. Installation in Raceway:
1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
2. Pull all conductors and cables together into raceway at same time.
3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

J. Exposed Cable Installation (only where specifically permitted):
1. Route cables parallel or perpendicular to building structural members and surfaces.
2. Protect cables from physical damage.

K. Direct Burial Cable Installation:

1. Provide trenching and backfilling in accordance with Sections 31 2316 and 31 2323.
2. Install cable with minimum cover of 36 inches unless otherwise indicated or required.
3. Protect cables from damage in accordance with NFPA 70.
4. Provide underground warning tape in accordance with Section 26 0553 along entire cable length.

L. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

M. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
2. Installation in Vertical Raceways: Provide supports where vertical rise exceeds permissible limits.

N. Terminate cables using suitable fittings.
1. Armored Cable (Type AC):
a. Use listed fittings and anti-short, insulating bushings.
b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.
c. Do not use direct-bearing set-screw type fittings for cables with aluminum armor.
2. Metal-Clad Cable (Type MC):
a. Use listed fittings.
b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.
c. Do not use direct-bearing set-screw type fittings for cables with aluminum armor.

O. Install conductors with a minimum of 12 inches of slack at each outlet.

P. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

Q. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

R. Make wiring connections using specified wiring connectors.
1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
3. Do not remove conductor strands to facilitate insertion into connector.
4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
5. Connections for Aluminum Conductors: Fill connectors with oxide inhibiting compound where not pre-filled by manufacturer.
6. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
7. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

S. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
1. Dry Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
a. For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape, followed by outer covering of vinyl insulating electrical tape.
2. Damp Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.
3. Wet Locations: Use heat shrink tubing.

T. Insulate ends of spare conductors using vinyl insulating electrical tape.

U. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.

V. Identify conductors and cables in accordance with Section 26 0553.

W. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

X. Life safety wiring/raceways shall be run within separate fire rated assemblies, protected by listed thermal barrier systems (FHIT), or other approved means and methods.

Y. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished, for a complete operating system.

3.04 FIELD QUALITY CONTROL

A. Refer to Division 01 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.
1. Disconnect surge protective devices (SPDs) prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPDs connected.

D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION

SECTION 26 0526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Grounding and bonding requirements.
B. Conductors for grounding and bonding.
C. Connectors for grounding and bonding.
D. Ground bars.
E. Ground rod electrodes.
F. Ground enhancement material.

1.02 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
B. NEMA GR 1 - Ground Rod Electrodes and Ground Rod Electrode Couplings; 2017.
C. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2017.
D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
E. NFPA 780 - Standard for the Installation of Lightning Protection Systems; 2020.
F. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Verify exact locations of underground metal water service pipe entrances to building.
   2. Coordinate the work with other trades to provide steel reinforcement complying with specified requirements for concrete-encased electrode.
   3. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
B. Sequencing:
   1. Do not install ground rod electrodes until final backfill and compaction is complete.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements for submittals procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.
C. Field quality control test reports.
D. Project Record Documents: Record actual locations of grounding electrode system components and connections.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.
B. Do not use products for applications other than as permitted by NFPA 70 and product listing.
C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
E. Grounding System Resistance:
   1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Architect. Precipitation within the previous 48 hours does not constitute normally dry conditions.
F. Grounding Electrode System:
   1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
      a. Provide continuous grounding electrode conductors without splice or joint.
      b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.
   2. Metal Underground Water Pipe(s):
      a. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet at an accessible location not more than 5 feet from the point of entrance to the building.
      b. Provide bonding jumper(s) around insulating joints/pipes to make pipe electrically continuous.
      c. Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.
   3. Metal In-Ground Support Structure:
      a. Provide connection to metal in-ground support structure that is in direct contact with earth in accordance with NFPA 70.
   4. Concrete-Encased Electrode:

a. Provide connection to concrete-encased electrode consisting of not less than 20 feet of either steel reinforcing bars or bare copper conductor not smaller than 4 AWG embedded within concrete foundation or footing that is in direct contact with earth in accordance with NFPA 70.

5. Ground Ring:
   a. If a lightning protection system is installed, provide a ground ring encircling the building or structure consisting of bare copper conductor not less than 2 AWG in direct contact with earth, installed at a depth of not less than 30 inches.
   b. Where location is not indicated, locate ground ring conductor at least 24 inches outside building perimeter foundation.
   c. Provide ground enhancement material around conductor.
   d. Provide connection from ground ring conductor to:
      1) Perimeter columns of metal building frame.
      2) Ground rod electrodes located at each corner of the building/structure.
6. Ground Rod Electrode(s):
   a. Where less than two other grounding electrodes are not present, provide three electrodes in an equilateral triangle configuration unless otherwise indicated or required.
   b. Space electrodes not less than 10 feet from each other and any other ground electrode.
   c. Where location is not indicated, locate electrode(s) at least 5 feet outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.
7. Ground Bar: Provide ground bar, separate from service equipment enclosure, for common connection point of grounding electrode system bonding jumpers as permitted in NFPA 70. Connect grounding electrode conductor provided for service-supplied system grounding to this ground bar.
   a. Ground Bar Size: 1/4 by 2 by 12 inches unless otherwise indicated or required.
   b. Ground Bar Mounting Height: 18 inches above finished floor unless otherwise indicated.

G. Bonding and Equipment Grounding:
1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
7. Provide bonding for interior metal piping systems in accordance with NFPA 70. This includes, but is not limited to:
   a. Metal water piping where not already effectively bonded to metal underground water pipe used as grounding electrode.
8. Provide bonding and equipment grounding for pools and fountains and associated equipment in accordance with NFPA 70.

H. Communications Systems Grounding and Bonding:
1. Provide intersystem bonding termination at service equipment or metering equipment enclosure and at disconnecting means for any additional buildings or structures in accordance with NFPA 70.
2. Provide bonding jumper in raceway from intersystem bonding termination to each communications room or backboard and provide ground bar for termination.
   a. Bonding Jumper Size: 6 AWG, unless otherwise indicated or required.
   b. Raceway Size: 3/4 inch trade size unless otherwise indicated or required.
   c. Ground Bar Size: 1/4 by 2 by 12 inches unless otherwise indicated or required.
   d. Ground Bar Mounting Height: 18 inches above finished floor unless otherwise indicated.

I. Lightning Protection Systems:
1. Do not use grounding electrode dedicated for lightning protection system for component of building grounding electrode system provided under this section.
2. Provide bonding of building grounding electrode system provided under this section and lightning protection grounding electrode system in accordance with NFPA 70 and NFPA 780.

2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
1. Provide products listed, classified, and labeled as suitable for the purpose intended.
2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 0526:
1. Use insulated copper conductors unless otherwise indicated.
   a. Exceptions:
      1) Use bare copper conductors where installed underground in direct contact with earth.
      2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
   1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
   2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
   3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.
D. Ground Bars:
   1. Description: Copper rectangular ground bars with mounting brackets and insulators.
   2. Size: As indicated.
   3. Holes for Connections: As indicated for connections to be made.
E. Ground Rod Electrodes:
   1. Comply with NEMA GR 1.
   2. Material: Copper-bonded (copper-clad) steel.
   3. Size: 3/4 inch diameter by 10 feet length, unless otherwise indicated.
F. Ground Enhancement Material:
   1. Description: Factory-mixed conductive material designed for permanent and maintenance-free improvement of grounding effectiveness by lowering resistivity.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that work likely to damage grounding and bonding system components has been completed.
B. Verify that field measurements are as indicated.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70.
   1. Outdoor Installations: Unless otherwise indicated, install with top of rod 6 inches below finished grade.
   2. Indoor Installations: Unless otherwise indicated, install with 4 inches of top of rod exposed.
D. Make grounding and bonding connections using specified connectors.
   1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
   2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
   3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
   4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
   5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
E. Identify grounding and bonding system components in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL
A. Refer to Division 01 - Quality Requirements, for additional requirements.
B. Inspect and test in accordance with NETA ATS except Section 4.
C. Perform inspections and tests listed in NETA ATS, Section 7.13.
D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
E. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

END OF SECTION

SECTION 26 0529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 Section Includes

A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.02 Reference Standards

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2019.

D. MFMA-4 - Metal Framing Standards Publication; 2004.

E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 Administrative Requirements

A. Coordination:

1. Coordinate sizes and arrangement of supports and bases with actual equipment and components to be installed.
2. Coordinate work to provide additional framing and materials required for installation.
3. Coordinate compatibility of support and attachment components with mounting surfaces at installed locations.
4. Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1. Do not install products on or provide attachment to concrete surfaces until concrete has cured; see Section 03 3000.

1.04 Submittals

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel/strut framing systems, nonpenetrating rooftop supports, and post-installed concrete/masonry anchors.

1.05 Quality Assurance

1.06 Delivery, Storage, and Handling

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 Support and Attachment Components

A. General Requirements:

1. Comply with the following. Where requirements differ, comply with most stringent.
   a. NFPA 70.
   b. Requirements of authorities having jurisdiction.
2. Provide required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for complete installation of electrical work.
3. Provide products listed, classified, and labeled as suitable for purpose intended, where applicable.
4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
5. Steel Components: Use corrosion-resistant materials suitable for environment where installed.
   a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
   b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Conduit and Cable Supports: Straps and clamps suitable for conduit or cable to be supported.

1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
2. Conduit Clamps: Bolted type unless otherwise indicated.

C. Outlet Box Supports: Hangers and brackets suitable for boxes to be supported.

D. Metal Channel/Strut Framing Systems:

1. Description: Factory-fabricated, continuous-slot, metal channel/strut and associated fittings, accessories, and hardware required for field assembly of supports.
2. Comply with MFMA-4.

E. Hanger Rods: Threaded, zinc-plated steel unless otherwise indicated.

F. Anchors and Fasteners:

1. Unless otherwise indicated and where not otherwise restricted, use anchor and fastener types indicated for specified applications.

PART 3 EXECUTION

3.01 Examination

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive support and attachment components.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 Installation

A. Install products in accordance with manufacturer's instructions.

B. Install hangers and supports in accordance with NECA 1.

C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

D. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
E. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
G. Equipment Support and Attachment:
   1. Use metal channel/strut secured to studs to support equipment surface mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
   2. Use metal channel/strut to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
   3. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
H. Conduit Support and Attachment: See Section 26 0533.13 for additional requirements.
I. Box Support and Attachment: See Section 26 0533.16 for additional requirements.
J. Interior Luminaire Support and Attachment: See Section 26 5100 for additional requirements.
K. Exterior Luminaire Support and Attachment: See Section 26 5600 for additional requirements.
L. Secure fasteners in accordance with manufacturer's recommended torque settings.
M. Remove temporary supports.

3.03 Field Quality Control
A. Refer to Division 01 - Quality Requirements, for additional requirements.
B. Inspect support and attachment components for damage and defects.
C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION

SECTION 26 0533.13 - CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).
B. Stainless steel rigid metal conduit (RMC).
C. Galvanized steel intermediate metal conduit (IMC).
D. Stainless steel intermediate metal conduit (IMC).
E. PVC-coated galvanized steel rigid metal conduit (RMC).
F. Flexible metal conduit (FMC).
G. Liquidtight flexible metal conduit (LFMC).
H. Galvanized steel electrical metallic tubing (EMT).
I. Stainless steel electrical metallic tubing (EMT).
J. Rigid polyvinyl chloride (PVC) conduit.
K. Electrical nonmetallic tubing (ENT).
L. Liquidtight flexible nonmetallic conduit (LFNC).
M. Reinforced thermosetting resin conduit (RTRC).

1.02 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2020.
B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2020.
C. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit; 2018.
D. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
E. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2013.
F. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2017.
G. NEMA BI 50058 - Electrical Nonmetallic Tubing (ENT); 2014 (Reaffirmed 2019).
H. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
I. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Metal Conduit and Intermediate Metal Conduit; 2018.
J. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2020.
K. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.
L. NEMA TC 14 (SERIES) - Reinforced Thermosetting Resin Conduit and Fittings Series; 2015.
M. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
N. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.
O. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.
P. UL 6A - Electrical Rigid Metal Conduit-Aluminum, Red Brass, and Stainless Steel; Current Edition, Including All Revisions.
Q. UL 360 - Liquid-Tight Flexible Metal Conduit; Current Edition, Including All Revisions.
R. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.
S. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.
T. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.
U. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.
V. UL 797A - Electrical Metallic Tubing - Aluminum and Stainless Steel; Current Edition, Including All Revisions.
W. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.
X. UL 1653 - Electrical Nonmetallic Tubing; Current Edition, Including All Revisions.
Y. UL 1660 - Liquid-Tight Flexible Nonmetallic Conduit; Current Edition, Including All Revisions.
Z. UL 2419 - Outline of Investigation for Electrically Conductive Corrosion Resistant Compounds; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate minimum sizes of conduits with actual type and quantity of conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
   2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections.
   3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections.
   4. Coordinate work to provide roof penetrations that preserve integrity of roofing system and do not void roof warranty.
   5. Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
B. Sequencing:
   1. Do not begin installation of conductors and cables until installation of conduit between termination points is complete.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements for submittals procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.
C. Shop Drawings:
   1. Indicate proposed arrangement for conduits to be installed within structural concrete slabs, where permitted.

2. Include proposed locations of roof penetrations and proposed methods for sealing.

D. Project Record Documents: Record actual routing for conduits installed underground, conduits embedded within concrete slabs, and conduits 2-inch (53 mm) trade size and larger.

1.05 QUALITY ASSURANCE

1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, use galvanized steel rigid metal conduit.

C. Underground:

1. Under Slab on Grade: Use galvanized steel rigid metal conduit (RMC), stainless steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), stainless steel intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit (RMC), galvanized steel electrical metallic tubing (EMT), stainless steel electrical metallic tubing (EMT), rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).

2. Exterior, Direct-Buried: Use galvanized steel rigid metal conduit (RMC), stainless steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), stainless steel intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit, galvanized steel electrical metallic tubing (EMT), stainless steel electrical metallic tubing (EMT), rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).

3. Exterior, Embedded Within Concrete: Use galvanized steel rigid metal conduit (RMC), stainless steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), stainless steel intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit (RMC), galvanized steel electrical metallic tubing (EMT), stainless steel electrical metallic tubing (EMT), rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).

4. Where rigid polyvinyl chloride (PVC) conduit is provided, transition to galvanized steel rigid metal conduit (RMC), stainless steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), stainless steel intermediate metal conduit (IMC), or schedule 80 rigid PVC conduit where emerging from underground.

5. Where rigid polyvinyl (PVC) conduit larger than 2-inch (53 mm) trade size is provided, use galvanized steel rigid metal conduit (RMC) elbows, stainless steel rigid metal conduit (RMC) elbows, galvanized steel intermediate metal conduit (IMC) elbows, stainless steel intermediate metal conduit (IMC) elbows, PVC-coated galvanized steel rigid metal conduit (RMC) elbows, or concrete-encased PVC elbows for bends.

D. Exposed, Exterior, Not Subject to Severe Physical Damage: Use galvanized steel rigid metal conduit (RMC), stainless steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), stainless steel intermediate metal conduit (IMC), galvanized steel electrical metallic tubing (EMT), or stainless steel electrical metallic tubing (EMT).

E. Flexible Connections to Vibrating Equipment:

1. Dry Locations: Use flexible metal conduit (FMC).

2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit (LFMC).

3. Maximum Length: 6 feet unless otherwise indicated.

2.02 CONDUIT - GENERAL REQUIREMENTS

A. Comply with NFPA 70.

B. Electrical Service Conduits: See Section 26 2100 for additional requirements.

C. Fittings for Grounding and Bonding: See Section 26 0526 for additional requirements.

D. Provide conduit, fittings, supports, and accessories required for complete raceway system.

E. Provide products listed, classified, and labeled as suitable for purpose intended.

F. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

B. Fittings:

1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.

2. Material: Use steel or malleable iron.

3. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.04 STAINLESS STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC stainless steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6A.

B. Fittings:

1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6A.

2. Material: Use stainless steel with corrosion resistance equivalent to conduit.

3. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.05 GALVANIZED STEEL INTERMEDIATE METAL CONDUIT (IMC)

A. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

B. Fittings:

1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 1242.
2. Material: Use steel or malleable iron.
3. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.06 STAINLESS STEEL INTERMEDIATE METAL CONDUIT (IMC)

A. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

B. Fittings:

1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 1242.

2.07 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.

B. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil, 0.040 inch.

C. PVC-Coated Boxes and Fittings:

1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
2. Nonhazardous Locations: Use boxes and fittings listed and labeled as complying with UL 514A, UL 514B, or UL 6.
3. Material: Use steel or malleable iron.
4. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil, 0.040 inch.

D. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil, 0.015 inch.

2.08 FLEXIBLE METAL CONDUIT (FMC)

A. Description: NFPA 70, Type FMC standard-wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems.

B. Fittings:

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material: Use steel or malleable iron.

2.09 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

B. Fittings:

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material: Use steel or malleable iron.

2.10 GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT galvanized steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material: Use steel or malleable iron.
3. Connectors and Couplings: Use compression (gland) type.
   a. Do not use indenter type connectors and couplings.
   b. Do not use set-screw type connectors and couplings.

2.11 STAINLESS STEEL ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT stainless steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797A.

B. Fittings:

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Connectors and Couplings: Use compression/gland or set-screw type.

2.12 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.

B. Fittings:

1. Manufacturer: Same as manufacturer of conduit to be connected.
2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.13 ELECTRICAL NONMETALLIC TUBING (ENT)

A. Description: NFPA 70, Type ENT electrical nonmetallic tubing complying with NEMA BI 50058 and listed and labeled as complying with UL 1653.

B. Fittings:

1. Manufacturer: Same as manufacturer of ENT to be connected.
2. Use solvent-welded type fittings.
3. Solvent-Welded Fittings: Rigid PVC fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; suitable for use with ENT.

2.14 LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT (LFNC)

A. Description: NFPA 70, Type LFNC liquidtight flexible nonmetallic conduit listed and labeled as complying with UL 1660.
B. Fittings:
1. Manufacturer: Same as manufacturer of conduit to be connected.
2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B; suitable for type of conduit to be connected.

2.15 REINFORCED THERMOSETTING RESIN CONDUIT (RTRC)

A. Description: NFPA 70, Type RTRC reinforced thermosetting resin conduit complying with NEMA TC 14 (SERIES).
B. Supports: As recommended by manufacturer.
C. Fittings: Same type and manufacturer as conduit to be connected.

2.16 ACCESSORIES

A. Conduit Joint Compound: Corrosion-resistant, electrically conductive compound listed as complying with UL 2419; suitable for use with conduit to be installed.
B. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
C. Epoxy Adhesive for RTRC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
D. Pull Strings: Use nylon or polyester tape with average breaking strength of not less than 1,250 lbf.
E. Sealing Compound for Hazardous/Classified Location Sealing Fittings: Listed for use with particular fittings to be installed.
F. Sealing Systems for Concrete Penetrations:
1. Sleeves: Provide water stop ring or cement coating that bonds to concrete to prevent water infiltration.
2. Rate for minimum of 40 psig; suitable for sealing around conduits to be installed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that mounting surfaces are ready to receive conduits.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Install conduit in accordance with NECA 1.
C. Galvanized Steel Rigid Metal Conduit (RMC): Install in accordance with NECA 101.
D. Intermediate Metal Conduit (IMC): Install in accordance with NECA 101.
E. PVC-Coated Galvanized Steel Rigid Metal Conduit (RMC): Install using only tools approved by manufacturer.
F. Rigid Polyvinyl Chloride (PVC) Conduit: Install in accordance with NECA 111.
G. Electrical Nonmetallic Tubing (ENT): Install in accordance with NECA 111.
H. Liquidtight Flexible Nonmetallic Conduit (LFNC): Install in accordance with NECA 111.
I. Conduit Routing:
1. Unless dimensioned, conduit routing indicated is diagrammatic.
2. Conceal conduits unless specifically indicated to be exposed.
3. Conduits in the following areas may be exposed, unless otherwise indicated:
a. Electrical rooms.
b. Mechanical equipment rooms.
c. Within joists in areas with no ceiling.
4. Unless otherwise approved, do not route exposed conduits:
a. Across floors.
b. Across roofs.
c. Across top of parapet walls.
d. Across building exterior surfaces.
5. Conduits installed underground or embedded in concrete may be routed in shortest possible manner unless otherwise indicated. Route other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
6. Arrange conduit to maintain adequate headroom, clearances, and access.
7. Arrange conduit to provide no more than equivalent of four 90-degree bends between pull points.
8. Arrange conduit to provide no more than 150 feet between pull points.
9. Route conduits above water and drain piping where possible.
J. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction; see Section 26 0529.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.

K. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
6. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
7. Secure joints and connections to provide mechanical strength and electrical continuity.

L. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Where conduits penetrate waterproof membrane, seal to maintain integrity of membrane.
6. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
7. Provide metal escutcheon plates for conduit penetrations exposed to public view.
8. Install firestopping to preserve fire resistance rating of partitions and other elements; see Section 07 8400.

M. Underground Installation:
1. Provide trenching and backfilling; see Section 31 2316.13.
2. Provide trenching and backfilling in accordance with Sections 31 2316 and 31 2323.
3. Minimum Cover, Unless Otherwise Indicated or Required:
   a. as required by NFPA 70 (NEC).
4. Provide underground warning tape along entire conduit length for service entrance where not concrete-encased; see Section 26 0553.

N. Concrete Encasement: Where conduits not otherwise embedded within concrete are indicated to be concrete-encased, provide minimum concrete cover of 3 inches on all sides unless otherwise indicated; see Section 03 3000.

O. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
3. Where calculated in accordance with NFPA 70 for reinforced thermosetting resin conduit (RTRC) conduit installed above ground to compensate for thermal expansion and contraction.
4. Where conduits are subject to earth movement by settlement or frost.

P. Conduit Sealing:
1. Use foam conduit sealant to prevent entry of moisture and gases. This includes, but is not limited to:
   a. Where conduits enter building from outside.
   b. Where service conduits enter building from underground distribution system.
   c. Where conduits enter building from underground.
   d. Where conduits may transport moisture to contact live parts.
2. Where conduits cross barriers between areas of potential substantial temperature differential, use foam conduit sealant at accessible point near penetration to prevent condensation. This includes, but is not limited to:
   a. Where conduits pass from outdoors into conditioned interior spaces.
   b. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

Q. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed. Leave minimum slack of 12 inches at each end.

R. Provide grounding and bonding; see Section 26 0526.

S. Identify conduits; see Section 26 0553.

3.03 FIELD QUALITY CONTROL

A. Refer to Division 01 - Quality Requirements, for additional requirements.

B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

C. Where coating of PVC-coated galvanized steel rigid metal conduit (RMC) contains cuts or abrasions, repair in accordance with manufacturer's instructions.

D. Correct deficiencies and replace damaged or defective conduits.

3.04 CLEANING

A. Clean interior of conduits to remove moisture and foreign matter.

3.05 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION

SECTION 26 0533.16 - BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
D. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
E. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).
F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
G. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
H. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
I. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.
J. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections.
6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures, boxes for hazardous (classified) locations, floor boxes, and underground boxes/enclosures.
C. Samples:
1. Floor Boxes: Provide one sample(s) of each floor box proposed for substitution upon request.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
E. Project Record Documents: Record actual locations for outlet and device boxes, pull boxes, cabinets and enclosures, floor boxes, and underground boxes/enclosures.

1.04 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 BOXES

A. General Requirements:
1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
3. Provide products listed, classified, and labeled as suitable for the purpose intended.
4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
1. Use sheet-steel boxes, fire rated boxes, or fire rated boxes for dry locations unless otherwise indicated or required.
2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
3. Use suitable concrete type boxes where flush-mounted in concrete.
4. Use suitable masonry type boxes where flush-mounted in masonry walls.

5. Use raised covers suitable for the type of wall construction and device configuration where required.
6. Use shallow boxes where required by the type of wall construction.
7. Do not use "through-wall" boxes designed for access from both sides of wall.
8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
12. Minimum Box Size, Unless Otherwise Indicated:
    a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size.
    b. Communications Systems Outlets: 4 inch square by 2-1/8 inch (100 by 54 mm) trade size.
    c. Ceiling Outlets: 4 inch octagonal or square by 1-1/2 inch deep (100 by 38 mm) trade size.
13. Wall Plates: Comply with Section 26 2726.
14. Manufacturers:
    a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com/#sle.
    b. Hubbell Incorporated; Bell Products: www.hubbell-rtb.com.
    c. Hubbell Incorporated; RACO Products: www.hubbell-rtb.com.
    d. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.
    e. Thomas & Betts Corporation: www.tnb.com/#sle.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
1. Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
2. NEMA EN 10250 Environment Type, Unless Otherwise Indicated.
3. Junction and Pull Boxes Larger Than 100 cubic inches:
    a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
4. Finish for Painted Steel Enclosures: Primed and field painted with color selected by architect unless otherwise indicated.

D. Floor Boxes:
1. Description: Floor boxes compatible with floor box service fittings provided in accordance with Section 26 2726; with partitions to separate multiple services; furnished with all components, adapters, and trims required for complete installation.
2. Use cast iron floor boxes within slab on grade.
3. Metallic Floor Boxes: Fully adjustable (with integral means for leveling adjustment prior to and after concrete pour).
4. Manufacturer: Same as manufacturer of floor box service fittings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
D. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.
E. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
F. Box Locations:
1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 3100 where approved by the Architect.
2. Unless dimensioned, box locations indicated are approximate.
3. Locate boxes for devices installed under other sections.
    a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 2726.
    b. Communications Systems Outlets: Comply with Section 27 1000.
4. Locate boxes so that wall plates do not span different building finishes.
5. Locate boxes so that wall plates do not cross masonry joints.
6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 24 inch horizontal separation unless otherwise listed and/or approved by the AHJ.
8. Acoustic-Rated Walls: Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches horizontal separation.
9. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
    a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads, and/or use other listed and approved means or methods to maintain fire rating.
    b. Do not install flush-mounted boxes with area larger than 16 square inches or such that the total aggregate area of openings exceeds 100 square inches for any 100 square feet of wall area unless using other listed and approved means or methods to maintain fire rating.

10. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
    a. Concealed above accessible suspended ceilings.
    b. Within joists in areas with no ceiling.
    c. Electrical rooms.
    d. Mechanical equipment rooms.

G. Box Supports:
1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.

H. Install boxes plumb and level.

I. Flush-Mounted Boxes:
1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.

J. Install boxes to preserve insulation integrity.

K. Metallic Floor Boxes: Install box level at the proper elevation to be flush with finished floor.

L. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

M. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

N. Close unused box openings.

O. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

P. Provide grounding and bonding in accordance with Section 26 0526.

3.02 CLEANING

A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.03 PROTECTION

A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION

SECTION 26 0543 - UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the following:
   1. Conduit, ducts, and duct accessories for direct-buried and concrete-encased duct banks, and single duct runs.
   2. Handholes and boxes.
   3. Manholes.

1.02 SUBMITTALS

A. Product Data: For accessories for manholes, handholes, and boxes.

B. Shop Drawings for Precast or Factory-Fabricated Underground Utility Structures: Include plans, elevations, sections, details, attachments to other work, and accessories, including the following:
   1. Duct entry provisions, including locations and duct sizes.
   2. Reinforcement details.
   3. Frame, cover, and entry design.
   4. Grounding details.
   5. Dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
   6. Joint details.

C. Shop Drawings for Factory-Fabricated Handholes and Boxes: Include dimensioned plans, sections, and elevations, and fabrication and installation details, including the following:
   1. Duct entry provisions, including locations and duct sizes.
   2. Cover design.
   3. Grounding details.
   4. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

D. Field quality-control test reports.

1.03 QUALITY ASSURANCE

A. Comply with ANSI C2.

B. Comply with NFPA 70.

PART 2 PRODUCTS

2.01 CONDUIT

A. Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1.

B. RNC: NEMA TC 2, Type EPC-40-PVC and Type EPC-80-PVC, UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B.

2.02 NONMETALLIC DUCTS AND DUCT ACCESSORIES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. ARNCO Corp.
   2. Beck Manufacturing.
   3. Cantex, Inc.
   4. CertainTeed Corp.; Pipe & Plastics Group.
   5. Condux International, Inc.
   6. ElecSys, Inc.
   7. Electri-Flex Company.
   8. IPEX Inc.
   9. Lamson & Sessions; Carlon Electrical Products.
   10. Manhattan/CDT; a division of Cable Design Technologies.
   11. Spiraduct/AFC Cable Systems, Inc.

B. Underground Plastic Utilities Duct: NEMA TC 6 & 8, Type EB-20-PVC, ASTM F 512, UL 651A, with matching fittings by the same manufacturer as the duct, complying with NEMA TC 9.

C. Duct Accessories:
   1. Duct Separators: Factory-fabricated rigid PVC interlocking spacers, sized for type and sizes of ducts with which used, and selected to provide minimum duct spacings indicated while supporting ducts during concreting or backfilling.
   2. Warning Tape: Underground-line warning tape specified in Division 26 Section "Identification for Electrical Systems."
   3. Concrete Warning Planks: Nominal 12 by 24 by 3 inches (300 by 600 by 76 mm) in size, manufactured from 6000-psi (41-MPa) concrete.
      a. Color: Red dye added to concrete during batching.
      b. Mark each plank with "ELECTRIC" in 2-inch- (50-mm-) high, 3/8-inch- (10-mm-) deep letters.

2.03 HANDHOLES AND BOXES

A. Description: Comply with SCTE 77.
   1. Color: Green.
   2. Configuration: Units shall be designed for flush burial and have [open] [closed] [integral closed] bottom, unless otherwise indicated.
   3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
   4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.

5. Cover Legend: Molded lettering, "ELECTRIC." or "TELEPHONE." for each service.
6. Duct Entrance Provisions: Duct-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
7. Handholes 12 inches wide by 24 inches long (300 mm wide by 600 mm long) and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

B. Fiberglass Handholes and Boxes with Polymer Concrete Frame and Cover: Sheet-molded, fiberglass-reinforced, polyester resin enclosure joined to polymer concrete top ring or frame.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Armorcast Products Company.
b. Carson Industries LLC.
c. Christy Concrete Products.
d. Synertech Moulded Products, Inc.; a division of Oldcastle Precast.

C. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with covers of fiberglass.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Carson Industries LLC.
b. Christy Concrete Products.
c. Nordic Fiberglass, Inc.

2.04 PRECAST MANHOLES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or a comparable product by one of the following:
1. E.C. Babbert
2. Christy Concrete Products.
3. Everly Concrete Products.
4. J.K. Precast LLC
5. Lindsay Concrete
6. Mack Industries.
7. Norwalk Concrete
8. Oldcastle Precast Group.

B. Comply with ASTM C 858 and with interlocking mating sections, complete with accessories, hardware, and features.
1. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks plus an additional 12 inches (300 mm) vertically and horizontally to accommodate alignment variations.
a. Windows shall be located no less than 6 inches (150 mm) from interior surfaces of walls, floors, or roofs of manholes, but close enough to corners to facilitate racking of cables on walls.
b. Window opening shall have cast-in-place, welded wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
c. Window openings shall be framed with at least two additional No. 4 steel reinforcing bars in concrete around each opening.

C. Concrete Knockout Panels: 1-1/2 to 2 inches (38 to 50 mm) thick, for future conduit entrance and sleeve for ground rod.

D. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

2.05 UTILITY STRUCTURE ACCESSORIES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or a comparable product by one of the following:
1. Neenah Foundry Company.
2. Bilco Company (The).
3. Campbell Foundry Company.
4. Carder Concrete Products.
5. Christy Concrete Products.
6. East Jordan Iron Works, Inc.
7. Elmhurst-Chicago Stone Co.
8. McKinley Iron Works, Inc.
9. Oldcastle Precast Group.
10. e Products, LLC.
11. Utility Vault Co.
12. Wausau Tile, Inc.

B. Manhole Frames, Covers, and Chimney Components: Comply with structural design loading specified for manhole.
1. Frame and Cover: Weatherproof, [gray cast iron complying with ASTM A 48/A 48M, Class 30B] [cast aluminum] with milled cover-to-frame bearing surfaces; diameter, [26 inches (660 mm)] [29 inches (737 mm)].
a. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
b. Special Covers: Recess in face of cover designed to accept finish material in paved areas.
2. Cover Legend: Cast in. Selected to suit system.

a. Legend: "ELECTRIC-LV" for duct systems with power wires and cables for systems operating at 600 V and less.
b. Legend: "ELECTRIC-HV" for duct systems with medium-voltage cables.
c. Legend: "SIGNAL" for communications, data, and telephone duct systems.

3. Manhole Chimney Components: Precast concrete rings with dimensions matched to those of roof opening.
   a. Mortar for Chimney Ring and Frame and Cover Joints: Comply with ASTM C 270, Type M, except for quantities less than 2.0 cu. ft. (60 L) where packaged mix complying with ASTM C 387, Type M, may be used.

C. Manhole Sump: Depression cast in floor.

D. Pulling Eyes in Concrete Walls: Eyebolt with reinforcing-bar fastening insert, 2-inch- (50-mm-) diameter eye, and 1-by-4-inch (25-by-100-mm) bolt.
   1. Working Load Embedded in 6-Inch (150-mm), 4000-psi (27.6-MPa) Concrete: 13,000-lbf (58-kN) minimum tension.

E. Pulling Eyes in Nonconcrete Walls: Eyebolt with reinforced fastening, 1-1/4-inch- (32-mm-) diameter eye, rated 2500-lbf (11-kN) minimum tension.

F. Pulling-In and Lifting Irons in Concrete Floors: 7/8-inch- (22-mm-) diameter, hot-dip galvanized, bent steel rod; stress relieved after forming; and fastened to reinforcing rod. Exposed triangular opening.
   1. Ultimate Yield Strength: 40,000-lbf (180-kN) shear and 60,000-lbf (270-kN) tension.

G. Bolting Inserts for Concrete Utility Structure Cable Racks and Other Attachments: Flared, threaded inserts of noncorrosive, chemical-resistant, nonconductive thermoplastic material; 1/2-inch (13-mm) ID by 2-3/4 inches (69 mm) deep, flared to 1-1/4 inches (32 mm) minimum at base.
   1. Tested Ultimate Pullout Strength: 12,000 lbf (53 kN) minimum.

H. Expansion Anchors for Installation after Concrete Is Cast: Zinc-plated, carbon-steel-wedge type with stainless-steel expander clip with 1/2-inch (13-mm) bolt, 5300-lbf (24-kN) rated pullout strength, and minimum 6800-lbf (30-kN) rated shear strength.

I. Cable Rack Assembly: Steel, hot-dip galvanized, except insulators.
   1. Stanchions: T-section or channel; 2-1/4-inch (57-mm) nominal size; punched with 14 holes on 1-1/2-inch (38-mm) centers for cable-arm attachment.
   2. Arms: 1-1/2 inches (38 mm) wide, lengths ranging from 3 inches (75 mm) with 450-lb (204-kg) minimum capacity to 18 inches (460 mm) with 250-lb (114-kg) minimum capacity. Arms shall have slots along full length for cable ties and be arranged for secure mounting in horizontal position at any vertical location on stanchions.
   3. Insulators: High-glaze, wet-process porcelain arranged for mounting on cable arms.

J. Duct-Sealing Compound: Nonhardening, safe for contact with human skin, not deleterious to cable insulation, and workable at temperatures as low as 35 deg F (2 deg C). Capable of withstanding temperature of 300 deg F (150 deg C) without slump and adhering to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.

K. Fixed Manhole Ladders: Arranged for attachment to wall of manhole. Ladder and mounting brackets and braces shall be fabricated from hot-dip galvanized steel.

L. Cover Hooks: Heavy duty, designed for lifts 60 lbf (270 N) and greater. Two required.

PART 3 EXECUTION

3.01 EARTHWORK

A. Cut and patch existing pavement in the path of underground ducts and utility structures according to Division 01 Section "Cutting and Patching."

B. Excavation and Backfill: Comply with Division 31 Section "Earth Moving,", but do not use heavy-duty, hydraulic-operated, compaction equipment on plastic raceways unless concrete encased.

C. Restore surface features at areas disturbed by excavation and reestablish original grades, unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

D. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Division 32 Sections "Turf and Grasses" and "Plants."

3.02 DUCT INSTALLATION

A. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes to drain in both directions.

B. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches (1220 mm) vertical and 12.5 feet (4 m)] [25 feet (7.5 m) horizontal, unless otherwise indicated.

C. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.

D. Duct Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches (250 mm) o.c. for 5-inch (125-mm) ducts, and vary proportionately for other duct sizes.
   1. Begin change from regular spacing to end-bell spacing 10 feet (3 m) from the end bell without reducing duct line slope and without forming a trap in the line.
   2. Direct-Buried Duct Banks: Install an expansion and deflection fitting in each conduit in the area of disturbed earth adjacent to manhole or handhole.
   3. Grout end bells into structure walls from both sides to provide watertight entrances.

E. Building Wall Penetrations: Make a transition from underground duct to rigid steel conduit at least 10 feet (3 m) outside the building wall without reducing duct line slope away from the building, and without forming a trap in the line. Use fittings manufactured for duct-to-conduit transition. Install conduit penetrations of building walls as specified in Division 26 Section "Common Work Results for Electrical."
F. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig (1.03-MPa) hydrostatic pressure.
G. Pulling Cord: Install 100-lbf- (445-N-) test nylon cord in ducts, including spares.
H. Concrete-Encased Ducts: Support ducts on duct separators.
   1. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, with not less than 5 spacers per 20 feet (6 m) of duct. Secure separators to earth and to ducts to prevent floating during concreting. Stagger separators approximately 6 inches (150 mm) between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
   2. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.
      a. Start at one end and finish at the other, allowing for expansion and contraction of ducts as their temperature changes during and after the pour. Use expansion fittings installed according to manufacturer's written recommendations, or use other specific measures to prevent expansion-contraction damage.
      b. If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch (19-mm) reinforcing rod dowels extending 18 inches (450 mm) into concrete on both sides of joint near corners of envelope.
   3. Pouring Concrete: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Use a plank to direct concrete down sides of bank assembly to trench bottom. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.
   4. Reinforcement: Reinforce concrete-encased duct banks where they cross disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.
   5. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
   6. Minimum Space between Ducts: 3 inches (75 mm) between ducts and exterior envelope wall, 2 inches (50 mm) between ducts for like services, and 4 inches (100 mm) between power and signal ducts.
   7. Depth: Install top of duct bank at least 24 inches (600 mm) below finished grade in areas not subject to deliberate traffic, and at least 30 inches (750 mm) below finished grade in deliberate traffic paths for vehicles, unless otherwise indicated.
   8. Stub-Ups: Use manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Extend concrete encasement throughout the length of the elbow.
   9. Stub-Ups: Use manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
      a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.
      b. Stub-Ups to Equipment: For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of base. Install insulated grounding bushings on terminations at equipment.
   10. Warning Tape: Bury warning tape approximately 12 inches (300 mm) above all concrete-encased ducts and duct banks. Align tape parallel to and within 3 inches (75 mm) of the centerline of duct bank. Provide an additional warning tape for each 12-inch (300-mm) increment of duct-bank width over a nominal 18 inches (450 mm). Space additional tapes 12 inches (300 mm) apart, horizontally.
I. Direct-Buried Duct Banks:
   1. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
   2. Space separators close enough to prevent sagging and deforming of ducts, with not less than [4] [5] spacers per 20 feet (6 m) of duct. Secure separators to earth and to ducts to prevent displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger spacers approximately 6 inches (150 mm) between tiers.
   3. Excavate trench bottom to provide firm and uniform support for duct bank. Prepare trench bottoms as specified in Division 31 Section "Earth Moving" for pipes less than 6 inches (150 mm) in nominal diameter.
   4. Install backfill as specified in Division 31 Section "Earth Moving."
   5. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand-place backfill to 4 inches (100 mm) over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction as specified in Division 31 Section "Earth Moving."

6. Install ducts with a minimum of 3 inches (75 mm) between ducts for like services and 6 inches (150 mm) between power and signal ducts.
7. Depth: Install top of duct bank at least 36 inches (900 mm) below finished grade, unless otherwise indicated.
8. Set elevation of bottom of duct bank below the frost line.
9. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of the elbow.
10. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
    a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.
    b. For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.
11. Warning Planks: Bury warning planks approximately 12 inches (300 mm) above direct-buried ducts and duct banks, placing them 24 inches (600 mm) o.c. Align planks along the width and along the centerline of duct bank. Provide an additional plank for each 12-inch (300-mm) increment of duct-bank width over a nominal 18 inches (450 mm). Space additional planks 12 inches (300 mm) apart, horizontally.

3.03 INSTALLATION OF CONCRETE MANHOLES

A. Comply with ASTM C 891, unless otherwise indicated.
B. Install units level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances.
C. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch (25-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.
D. Manhole Roof: Install with rooftop at least 15 inches (380 mm) below finished grade.
E. Manhole Frame: In paved areas and trafficways, set frames flush with finished grade. Set other manhole frames 1 inch (25 mm) above finished grade.
F. Manholes with Fixed Ladders: Offset access opening from manhole centerlines to align with ladder.
G. Install chimney, constructed of precast concrete collars and rings to support frame and cover and to connect cover with manhole roof opening. Provide moisture-tight masonry joints and waterproof grouting for cast-iron frame to chimney.
H. Hardware: Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated.
I. Fixed Manhole Ladders: Arrange to provide for safe entry with maximum clearance from cables and other items in manholes.
J. Field-Installed Bolting Anchors: Do not drill deeper than 3-7/8 inches (98 mm) for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.
K. Warning Sign: Install "Confined Space Hazard" warning sign on the inside surface of each manhole cover.

3.04 INSTALLATION OF HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of ducts, and seal joint between box and extension as recommended by the manufacturer.
B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch (12.7-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.
C. Elevation: In paved areas and trafficways, set so cover surface will be flush with finished grade. Set covers of other handholes 1 inch (25 mm) above finished grade.
D. Install handholes and boxes with bottom 36" below grade or below frost line if deeper.
E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.
F. Field-cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.05 GROUNDING

A. Ground underground ducts and utility structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

3.06 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:
    1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
    2. Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
    3. Test manhole and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Division 26 Section "Grounding and Bonding for Electrical Systems."
B. Correct deficiencies and retest as specified above to demonstrate compliance.

3.07 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.
B. Clean internal surfaces of manholes, including sump. Remove foreign material.

END OF SECTION

SECTION 26 0553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical identification requirements.
B. Identification nameplates and labels.
C. Wire and cable markers.
D. Voltage markers.
E. Underground warning tape.
F. Warning signs and labels.

1.02 REFERENCE STANDARDS

A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2011 (Reaffirmed 2017).
B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2011 (Reaffirmed 2017).
C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
D. NFPA 70E - Standard for Electrical Safety in the Workplace; 2021.
E. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
  1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
B. Sequencing:
  1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
  2. Do not install identification products until final surface finishes and painting are complete.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements for submittals procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

A. Identification for Equipment:
  1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
    a. Switchgear:
      1) Identify ampere rating.
      2) Identify voltage and phase.
      3) Identify power source and circuit number. Include location when not within sight of equipment.
      4) Use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
    b. Switchboards:
      1) Identify ampere rating.
      2) Identify voltage and phase.
      3) Identify power source and circuit number. Include location when not within sight of equipment.
      4) Use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
    c. Panelboards:
      1) Identify ampere rating.
      2) Identify voltage and phase.
      3) Identify power source and circuit number. Include location when not within sight of equipment.
      4) Use typewritten circuit directory (1/8" font minimum) to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
    d. Transformers:
      1) Identify kVA rating.
      2) Identify voltage and phase for primary and secondary.
      3) Identify load(s) served. Include location.
    e. Enclosed switches, circuit breakers, and motor controllers:
      1) Identify voltage and phase.
      2) Identify power source and circuit number. Include location when not within sight of equipment.
      3) Identify load(s) served. Include location when not within sight of equipment.
    f. Time Switches:
      1) Identify load(s) served and associated circuits controlled. Include location.
    g. Enclosed Contactors:
      1) Identify ampere rating.
      2) Identify voltage and phase.
      3) Identify configuration, e.g., E.O.E.H. (electrically operated, electrically held) or E.O.M.H. (electrically operated, mechanically held).
      4) Identify coil voltage.
      5) Identify load(s) and associated circuits controlled. Include location.
    h. Transfer Switches:

1) Identify voltage and phase.
2) Identify power source and circuit number for both normal power source and standby power source. Include location when not within sight of equipment.
3) Identify load(s) served. Include location when not within sight of equipment.
4) Identify short circuit current rating based on the specific overcurrent protective device type and settings protecting the transfer switch.

2. Service Equipment:
   a. Use identification nameplate to identify each service disconnecting means.
   b. For buildings or structures supplied by more than one service, or any combination of branch circuits, feeders, and services, use identification nameplate or means of identification acceptable to authority having jurisdiction at each service disconnecting means to identify all other services, feeders, and branch circuits supplying that building or structure. Verify format and descriptions with authority having jurisdiction.
3. Emergency System Equipment:
   a. Use identification nameplate or voltage marker to identify emergency system equipment in accordance with NFPA 70.
   b. Use identification nameplate at each piece of service equipment to identify type and location of on-site emergency power sources.
4. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70 including but not limited to the following.
   a. Service equipment.
   b. Industrial control panels.
   c. Motor control centers.
   d. Elevator control panels.
   e. Industrial machinery.
5. Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment, such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized.
   a. Minimum Size: 3.5 by 5 inches.
   b. Legend: Include orange header that reads "WARNING", followed by the word message "Arc Flash and Shock Hazard; Appropriate PPE Required; Do not operate controls or open covers without appropriate personal protection equipment; Failure to comply may result in injury or death; Refer to NFPA 70E for minimum PPE requirements" or approved equivalent.
6. Use warning signs to identify electrical hazards for entrances to all rooms and other guarded locations that contain exposed live parts operating at 600 V nominal or less with the word message "DANGER; Electrical hazard; Authorized personnel only" or approved equivalent.
7. Use warning labels, identification nameplates, or identification labels to identify electrical hazards for equipment where multiple power sources are present with the word message "DANGER; Hazardous voltage; Multiple power sources may be present; Disconnect all electric power including remote disconnects before servicing" or approved equivalent.

B. Identification for Conductors and Cables:
1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 0519.
2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
3. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
   a. At each source and load connection.
   b. Within boxes when more than one circuit is present.
   c. Within equipment enclosures when conductors and cables enter or leave the enclosure.
4. Use underground warning tape to identify direct buried cables.

C. Identification for Devices:
1. Use identification label to identify fire alarm system devices.
   a. For devices concealed above suspended ceilings, provide additional identification on ceiling tile below device location.
2. Use identification label to identify serving branch circuit for all receptacles.
   a. For receptacles in all locations, provide identification on inside surface of wallplate.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:
1. Materials:
   a. Indoor Clean, Dry Locations: Use plastic nameplates.
   b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
2. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.
4. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.

5. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.

B. Identification Labels:
1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:
1. Minimum Size: 1 inch by 2.5 inches.
2. Legend:
a. Equipment designation or other approved description.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height:
a. Equipment Designation: 1/2 inch.
5. Color:
a. Normal Power System: White text on black background.
b. Emergency Power System: White text on red background.
c. Fire Alarm System: White text on red background.

D. Format for Receptacle Identification:
1. Minimum Size: 3/8 inch by 1.5 inches.
2. Legend: Power source and circuit number or other designation indicated.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 3/16 inch.
5. Color: Black text on clear background.

2.03 WIRE AND CABLE MARKERS

A. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.

B. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

C. Legend: Power source and circuit number or other designation indicated.

D. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.

E. Minimum Text Height: 1/8 inch.

F. Color: Black text on white background unless otherwise indicated.

2.04 VOLTAGE MARKERS

A. Minimum Size:

B. Legend:

C. Color: Black text on orange background unless otherwise indicated.

2.05 UNDERGROUND WARNING TAPE

A. Materials: Use non-detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.

B. Non-detectable Type Tape: 6 inches wide, with minimum thickness of 4 mil.

C. Legend: Type of service, continuously repeated over full length of tape.

D. Color.

2.06 WARNING SIGNS AND LABELS

A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

B. Warning Signs:
1. Materials.
2. Minimum Size: 7 by 10 inches unless otherwise indicated.

C. Warning Labels:
1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
1. Surface-Mounted Equipment: Enclosure front.
2. Flush-Mounted Equipment: Inside of equipment door.
3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
4. Elevated Equipment: Legible from the floor or working platform.
5. Interior Components: Legible from the point of access.
6. Conductors and Cables: Legible from the point of access.
7. Devices: Inside face of cover.

C. Install identification products centered, level, and parallel with lines of item being identified.

D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.

1. Do not use adhesives on exterior surfaces except where substrate cannot be penetrated.

E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

F. Install underground warning tape above buried lines with one tape per trench at 3 inches below finished grade.

G. Secure rigid signs using stainless steel screws.

H. Mark all handwritten text, where permitted, to be neat and legible.

3.03 FIELD QUALITY CONTROL

A. Refer to Division 01 - Quality Requirements, for additional requirements.

B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION

SECTION 26 0583 - WIRING CONNECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical connections to equipment.

1.02 REFERENCE STANDARDS

A. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).

B. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2016.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.

2. Determine connection locations and requirements.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Products: Listed, classified, and labeled as suitable for the purpose intended.

PART 2 PRODUCTS

2.01 MATERIALS

A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.

1. Colors: Comply with NEMA WD 1.

2. Cord Construction: NFPA 70, Type SO, multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.

3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

B. Disconnect Switches: As specified in Section 26 2816.16 and in individual equipment sections.

C. Wiring Devices: As specified in Section 26 2726.

D. Flexible Conduit: As specified in Section 26 0533.13.

E. Wire and Cable: As specified in Section 26 0519.

F. Boxes: As specified in Section 26 0533.16.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.

B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.

C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

D. Provide receptacle outlet to accommodate connection with attachment plug.

E. Provide cord and cap where field-supplied attachment plug is required.

F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.

H. Install terminal block jumpers to complete equipment wiring requirements.

I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

J. Coolers and Freezers: Cut and seal conduit openings in freezer and cooler walls, floor, and ceilings.

END OF SECTION

SECTION 26 0923 - LIGHTING CONTROL DEVICES

PART 1 GENERAL

1.01 Section Includes

A. Occupancy sensors.
B. Time switches.
C. In-wall interval timers.
D. Outdoor photo controls.
E. Lighting contactors.

1.02 Reference Standards

A. ANSI C136.10 - American National Standard for Roadway and Area Lighting Equipment - Locking-Type Photocontrol Devices and Mating Receptacles - Physical and Electrical Interchangeability and Testing; 2017.
B. ANSI C136.24 - American National Standard for Roadway and Area Lighting Equipment - Nonlocking (Button) Type Photocontrols; 2020.
C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
E. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
F. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).
G. NEMA IA 10030 - Industrial Control and Systems: Enclosures; 2024.
H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
I. UL 773 - Plug-in, Locking Type Photocontrols for Use with Area Lighting; Current Edition, Including All Revisions.
J. UL 773A - Nonindustrial Photoelectric Switches for Lighting Control; Current Edition, Including All Revisions.
K. UL 916 - Energy Management Equipment; Current Edition, Including All Revisions.
L. UL 917 - Clock-Operated Switches; Current Edition, Including All Revisions.
M. UL 1472 - Solid-State Dimming Controls; Current Edition, Including All Revisions.
N. UL 60947-1 - Low-Voltage Switchgear and Controlgear - Part 1: General Rules; Current Edition, Including All Revisions.
O. UL 60947-4-1 - Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-starters - Electromechanical Contactors and Motor-starters; Current Edition, Including All Revisions.

1.03 Administrative Requirements

A. Coordination:
   1. Coordinate the placement of lighting control devices with millwork, furniture, equipment, etc. installed under other sections.
   2. Coordinate placement of wall switch occupancy sensors with installed door swings.
   3. Coordinate the placement of occupancy sensors with millwork, furniture, equipment or other potential obstructions to motion detection coverage installed under other sections.
   4. Coordinate lighting control device product selections with luminaire characteristics; see Section 26 5100 and lighting fixture schedule.
   5. Notify Architect of conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.04 Submittals

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Include ratings, operating modes or sequence of functions, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
C. Field quality control reports.
D. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
E. Project Record Documents: Record actual installed locations and settings for lighting control devices.

1.05 Warranty

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 Lighting Control Devices - General Requirements

A. Provide products listed, classified, and labeled as suitable for purpose intended.
B. Unless specifically indicated to be excluded, provide all required conduit, wiring, connectors, hardware, components, accessories, etc. for a complete operating system.

2.02 Occupancy Sensors

A. Manufacturers:
   1. Hubbell Incorporated: www.hubbell.com/#sle.
   2. Lutron Electronics Company, Inc: www.lutron.com/#sle.
   3. Substitutions: Refer to Division 01 - Product Requirements.
B. General Requirements:
   1. Description: Factory-assembled commercial specification grade devices for indoor use capable of sensing both major motion, such as walking, and minor motion, such as small desktop level movements, according to published coverage areas, for automatic control of load indicated.
   2. Sensor Technology:

a. Passive Infrared/Ultrasonic Dual Technology Occupancy Sensors: Designed to detect occupancy using combination of both passive infrared and ultrasonic technologies.
3. Provide LED to visually indicate motion detection with separate color LEDs for each sensor type in dual technology units.
4. Operation: Unless otherwise indicated, occupancy sensor to turn load on when occupant presence is detected and to turn load off when no occupant presence is detected during adjustable turn-off delay time interval.
5. Dual Technology Occupancy Sensors: Field configurable turn-on and hold-on activation with settings for activation by either or both sensing technologies.
6. Turn-Off Delay: Field adjustable, with time delay settings up to 30 minutes.
7. Compatibility (Non-Dimming Sensors): Suitable for controlling incandescent lighting, low-voltage lighting with electronic and magnetic transformers, fluorescent lighting with electronic and magnetic ballasts, and fractional motor loads, with no minimum load requirements.

C. Wall Switch Occupancy Sensors:
1. General Requirements:
a. Description: Occupancy sensors designed for installation in standard wall box at standard wall switch mounting height with field of view of 180 degrees, integrated manual control capability, and no leakage current to load in off mode.
b. Manual-Off Override Control: When used to turn off load while in automatic-on mode, unit to revert back to automatic mode after no occupant presence is detected during delayed-off time interval.
2. Passive Infrared/Ultrasonic Dual Technology Wall Switch Occupancy Sensors: Capable of detecting motion within area of 900 square feet.

D. Wall Dimmer Occupancy Sensors:
1. General Requirements:
a. Description: Occupancy sensors designed for installation in standard wall box at standard wall switch mounting height with field of view of 180 degrees, integrated dimming control capability, and no leakage current to load in off mode.
b. Dimmer: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, and listed as complying with UL 1472; type and rating suitable for load controlled.

E. Ceiling Mounted Occupancy Sensors:
1. General Requirements:
a. Description: Low profile occupancy sensors designed for ceiling installation.
2. Passive Infrared/Ultrasonic Dual Technology Ceiling Mounted Occupancy Sensors:
a. Standard Range Sensors: Capable of detecting motion within area of 450 square feet at mounting height of 9 feet, with field of view of 360 degrees.
b. Extended Range Sensors: Capable of detecting motion within area of 1,200 square feet at mounting height of 9 feet, with field of view of 360 degrees.

F. Power Packs for Low-Voltage Occupancy Sensors:
1. Description: Plenum rated, self-contained low-voltage class 2 transformer and relay compatible with specified low-voltage occupancy sensors for switching of line-voltage loads.
2. Provide quantity and configuration of power and slave packs with all associated wiring and accessories to control the load indicated on drawings.
3. Input Supply Voltage: 120 V ac unless otherwise indicated.

2.03 Time Switches

A. Manufacturers:
1. Intermatic, Inc: www.intermatic.com/#sle.
2. Paragon, a brand of Invensys Controls: www.invensyscontrols.com.
3. Tork, a division of NSI Industries LLC: www.tork.com/#sle.
4. Substitutions: Refer to Division 01 - Product Requirements.

B. Digital Electronic Time Switches:
1. Description: Factory-assembled solid state programmable controller with LCD display, listed and labeled as complying with UL 916 or UL 917.
2. Program Capability:
a. Astronomic Time Switches (outdoor circuits): Single channel, capable of different schedule for each day of the week with additional holiday schedule available to override normal schedule for selected days and field-configurable astronomic feature to automatically adjust for seasonal changes in sunrise and sunset times.
3. Schedule Capacity: Not less than 16 programmable on/off operations.
4. Provide automatic daylight savings time and leap year compensation.
5. Provide power outage backup to retain programming and maintain clock.
6. Manual override: Capable of overriding current schedule both permanently and temporarily until next scheduled event.
7. Provide remote photocell input with light level adjustment.
8. Input Supply Voltage: As indicated on the drawings.

C. Electromechanical Time Switches:
1. Description: Factory-assembled controller with motor-operated timing dial mechanism and adjustable trippers for setting on/off operations, listed and labeled as complying with UL 917.
2. Program Capability:

a. 24-Hour Time Switches (indoor circuits): With same schedule for each day of the week and skip-a-day feature to omit selected days.

3. Schedule Capacity:
   a. 24-Hour Time Switches: Accommodating not less than 12 pairs of selected on/off operations per day.
4. Manual override: Capable of overriding current schedule both permanently and temporarily until next scheduled event.
5. Input Supply Voltage: As indicated on the drawings.
6. Provide lockable enclosure; environmental type per NEMA EN 10250 as specified for the following installation locations:

2.04 In-Wall Interval Timers

A. Manufacturers:
   1. Intermatic, Inc: www.intermatic.com/#sle.
   2. Tork, a division of NSI Industries LLC: www.tork.com/#sle.

B. Digital Electronic In-Wall Interval Timers:
   1. Description: Factory-assembled solid state programmable controller with LCD display, suitable for mounting in standard wall box, and listed and labeled as complying with UL 916 or UL 917.
   2. Program Capability: Designed to turn load off at end of preset time interval.
   3. Time Interval: Field selectable range of presets available up to 12 hours.
   4. Provide field selectable audible and visual indication to warn that end of interval operation is about to turn off load.
   5. Provide power outage backup to retain programming and maintain clock.
   6. Manual override: Capable of both turning load off and resetting timer to original preset time interval.
   7. Switch Configuration: Suitable for use in either SPST or 3-way application.

2.05 Outdoor Photo Controls

A. Stem-Mounted Outdoor Photo Controls:
   1. Description: Direct-wired photo control unit with threaded conduit mounting stem and field-adjustable swivel base, listed and labeled as complying with UL 773A.
   2. Housing: Weatherproof, impact resistant polycarbonate.
   3. Photo Sensor: Cadmium sulfide.
   4. Provide external sliding shield for field adjustment of light level activation.
   5. Light Level Activation: 1 to 5 footcandles turn-on and 3 to 1 turn-off to turn-on ratio with delayed turn-off.
   6. Voltage: As required to control load indicated on drawings.
   7. Failure Mode: Fails to the on position.
   8. Load Rating: As required to control load indicated on drawings.

B. Locking Receptacle-Mounted Outdoor Photo Controls
   1. Description: Plug-in locking type photo control unit complying with ANSI C136.10 for mounting on compatible receptacle, listed and labeled as complying with UL 773.
   2. Housing: Weatherproof, impact resistant UV stabilized polypropylene, color to be selected.
   3. Photo Sensor: Cadmium sulfide.
   4. Light Level Activation: 1 to 3 footcandles turn-on and 1.5 to 1 turn-off to turn-on ratio with instant turn-on and delayed turn-off.
   5. Voltage: As required to control load indicated on drawings.
   6. Failure Mode: Fails to the on position.
   7. Load Rating: As required to control load indicated on drawings.
   8. Surge Protection: 160 joule metal oxide varistor.

C. Button Type Outdoor Photo Controls
   1. Description: Direct-wired photo control unit complying with ANSI C136.24 with weatherproof gasketed wall plate where required or indicated, listed and labeled as complying with UL 773A.
   2. Housing: Weather resistant polycarbonate.
   3. Photo Sensor: Cadmium sulfide.
   4. Light Level Activation: 1 to 3 footcandles turn-on and 3 to 1 turn-off to turn-on ratio with delayed turn-off.
   5. Voltage: As required to control load indicated on drawings.
   6. Failure Mode: Fails to the on position.
   7. Load Rating: As required to control load indicated on drawings.

2.06 Lighting Contactors

A. Manufacturers:
   1. ABB/GE: www.geindustrial.com/#sle.
   2. Eaton Corporation: www.eaton.com/#sle.
   3. Rockwell Automation Inc; Allen-Bradley Products: ab.rockwellautomation.com/#sle.
   4. Schneider Electric; Square D Products: www.schneider-electric.us/#sle.
   5. Siemens Industry, Inc: www.usa.siemens.com/#sle.
   6. Substitutions: See Section 01 6000 - Product Requirements.

B. Description: Magnetic lighting contactors complying with NEMA ICS 2, and listed and labeled as complying with UL 60947-1 and UL 60947-4-1; noncombination type unless otherwise indicated; ratings, configurations and features as indicated on drawings.

C. Short Circuit Current Rating:

D. Enclosures:
   1. Comply with NEMA IA 10030.

2. Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
3. Finish: Manufacturer's standard unless otherwise indicated.

PART 3 EXECUTION

3.01 Examination

A. Verify that field measurements are as indicated.
B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
C. Verify that openings for outlet boxes are neatly cut and will be completely covered by devices or wall plates.
D. Verify that final surface finishes are complete, including painting.
E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to lighting control devices.
F. Verify that service voltage and ratings of lighting control devices are appropriate for service voltage and load requirements at location to be installed.
G. Verify that conditions are satisfactory for installation prior to starting work.

3.02 Installation

A. Install lighting control devices in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
B. Coordinate locations of outlet boxes provided under Section 26 0533.16 for installation of lighting control devices provided under this section.
C. Maintain separation of remote-control, signaling, and power-limited circuits.
1. See manufacturer instructions and Section 26 0519 for control wiring conductors, wiring methods, and identification requirements.
D. Install lighting control devices in accordance with manufacturer's instructions.
E. Unless otherwise indicated, connect lighting control device grounding terminal or conductor to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
F. Install lighting control devices plumb and level, and held securely in place.
G. Where required and not furnished with lighting control device, provide wall plate; see Section 26 2726.
H. Provide required supports; see Section 26 0529.
I. Where applicable, install lighting control devices and associated wall plates to fit completely flush to mounting surface with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
J. Identify lighting control devices; see Section 26 0553.
K. Occupancy Sensor Locations:
1. Locate ultrasonic and dual technology passive infrared/ultrasonic occupancy sensors minimum of 4 feet from air supply ducts or other sources of heavy air flow and as per manufacturer's recommendations, in order to minimize false triggers.
L. Outdoor Photo Control Locations:
1. Where possible, locate outdoor photo controls with photo sensor facing north. If north facing photo sensor is not possible, install with photo sensor facing east, west, or down.
2. Locate outdoor photo controls so that photo sensors do not face artificial light sources, including light sources controlled by photo control itself.
M. Install outdoor photo controls so that connections are weatherproof. Do not install photo controls with conduit stem facing up in order to prevent infiltration of water into photo control.

3.03 Field Quality Control

A. Refer to Division 01 - Quality Requirements, for additional requirements.
B. Inspect each lighting control device for damage and defects.
C. Test occupancy sensors to verify proper operation, including time delays and ambient light thresholds where applicable. Verify optimal coverage for entire room or area. Record test results in written report to be included with submittals.
D. Test time switches to verify proper operation.
E. Test outdoor photo controls to verify proper operation, including time delays where applicable.
F. Correct wiring deficiencies and replace damaged or defective conductors, cables, and lighting control devices.

3.04 Adjusting

A. Adjust devices and wall plates to be flush and level.
B. Adjust occupancy sensor settings to minimize undesired activations while optimizing energy savings, and to achieve desired function as indicated or as directed by Architect.
C. Where indicated or as directed by Architect, install factory masking material or adjust integral blinders on passive infrared (PIR) and dual technology occupancy sensor lenses to block undesired motion detection.
D. Adjust time switch settings to achieve desired operation schedule as indicated or as directed by Architect. Record settings in written report to be included with submittals.
E. Adjust external sliding shields on outdoor photo controls under optimum lighting conditions to achieve desired turn-on and turn-off activation as indicated or as directed by Architect.

3.05 Cleaning

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.06 Closeout Activities

A. Training: Train Owner's personnel on operation, adjustment, programming, and maintenance of lighting control devices.

1. Use operation and maintenance manual as training reference, supplemented with additional training materials.
2. Location: At project site.

END OF SECTION

PART 2 PRODUCTS

1.01 Wiring Devices - General Requirements

A. Provide wiring devices suitable for intended use with ratings adequate for load served.

1.02 WIRING DEVICE APPLICATIONS

A. Provide wiring devices suitable for intended use and with ratings adequate for load served.

B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.

C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.

D. Provide tamper resistant receptacles for receptacles installed in dwelling units.

E. Provide GFCI protection for receptacles installed within 6 feet of sinks.

F. Provide GFI protection for all receptacles installed in kitchens.

G. Provide GFCI protection for receptacles serving electric drinking fountains.

1.03 WIRING DEVICE FINISHES

A. Finish selected by owner and architectural representative.

1.04 WALL SWITCHES

A. Manufacturers:

1. Hubbell Incorporated: www.hubbell.com/#sle.
2. Hubbell Incorporated: www.hubbell-wiring.com.
3. Leviton Manufacturing Company, Inc: www.leviton.com.
4. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us.
5. Substitutions: Refer to Division 01 - Product Requirements.

B. General Use Switches (only where specifically noted): AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.

C. Accessible Wall Switches (all public and private exposed locations): Industrial specification grade, 20 A, 120/277 V with decorator style rocker type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

D. Lighted Wall Switches: (Concealed locations and mechanical/electrical spaces); and Industrial specification grade, 20 A, 120 V with illuminated decorator style rocker type switch actuator and maintained contacts; illuminated with load off; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

E. Pilot Light Wall Switches: (for use with contactors) Industrial specification grade, 20 A, 120/277 V with red illuminated standard toggle type switch actuator and maintained contacts and illuminated with load on. Provide single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

F. Locking Wall Switches: Industrial specification grade, 20 A, 120 V with lever type keyed switch actuator and maintained contacts; switches keyed alike; single pole single throw or double pole single throw as indicated on the drawings.

G. Momentary Contact Wall Switches (for use with mechanically held contactors, door controllers, and where shown on plan): Industrial specification grade, 20 A, 120 V with toggle type three position switch actuator and momentary contacts; single pole double throw, off with switch actuator in center position.

1.05 WALL DIMMERS

A. Wall Dimmers - General Requirements: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.

B. Control: Decorator rocker control type with preset slide adjustment.

1.06 RECEPTACLES

A. Manufacturers:

1. Hubbell Incorporated: www.hubbell.com/#sle.
2. Hubbell Incorporated: www.hubbell-wiring.com.
3. Leviton Manufacturing Company, Inc: www.leviton.com.
4. Lutron Electronics Company, Inc; Designer Style: www.lutron.com/#sle.
5. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
6. Source Limitations: Where wall controls are furnished as part of lighting control system, provide accessory matching receptacles and wallplates by the same manufacturer in locations indicated.

B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498and where applicable FS W-C-596; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
2. NEMA configurations specified are according to NEMA WD 6.
3. Hospital Grade Receptacles (healthcare locations): Listed as complying with UL 498 Supplement SD, with green dot hospital grade mark on device face.

C. Convenience Receptacles:

1. Standard Convenience Receptacles (common areas): Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.

2. Tamper Resistant Convenience Receptacles (dwelling units): Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type; single or duplex as indicated on the drawings.

D. GFCI Receptacles:

1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
2. Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SD suitable for installation in damp or wet locations.
3. Tamper Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type.

1.07 COMMUNICATIONS OUTLETS

A. Telephone Outlet:

1. Single RJ-45 jack for terminating 100-ohm, balanced, four-pair UTP; TIA/EIA-568-B.1 complying with Category 5e. Comply with UL 1863.
2. Outlet color to be verified with owners IT personnel.

B. Data Outlet:

1. Single RJ-45 jack for terminating 100-ohm, balanced, four-pair UTP; TIA/EIA-568-B.1 complying with Category 5e. Comply with UL 1863.
2. Outlet color to be verified with owners IT personnel.

C. TV Outlet:

1. Type F coaxial cable connector.

D. Combination Outlet:

1. Any combination of telephone, data, or television outlets as noted on plans. Provide in a common box with a common faceplate.

1.08 Wall Plates and Covers

A. Manufacturers:

1. Hubbell Incorporated: www.hubbell-wiring.com.
2. Leviton Manufacturing Company, Inc: www.leviton.com.
3. Lutron Electronics Company, Inc: www.lutron.com/sle.
4. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us.
5. Substitutions: Refer to Division 01 - Product Requirements.

B. Wall Plates: Comply with UL 514D.

1. Configuration: One piece cover for quantity and types of corresponding wiring devices.
2. Size: Standard; do not use oversized plates without architect approval.
3. Screws: Metal with slotted heads finished to match wall plate finish.

C. Nylon Wall Plates: Smooth finish, high-impact thermoplastic.

D. Weatherproof Receptacle Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

E. Wall plates shall be uniform in color, style and material within an area for all receptacle, switch and communications devices.

F. For wall mounted telephones (above 36” AFF), wall plate shall have telephone mounting studs.

1.09 FLOOR BOX SERVICE FITTINGS

A. Description: Service fittings compatible with floor boxes provided under Section 26 0533.16 with components, adapters, and trims required for complete installation.

B. Flush Floor Service Fittings:

END OF SECTION

SECTION 26 2813 - FUSES

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. NEMA FU 1 - Low Voltage Cartridge Fuses; 2012.

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. UL 248-1 - Low-Voltage Fuses - Part 1: General Requirements; Current Edition, Including All Revisions.

D. UL 248-12 - Low-Voltage Fuses - Part 12: Class R Fuses; Current Edition, Including All Revisions.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate fuse clips furnished in equipment provided under other sections for compatibility with indicated fuses.

2. Coordinate fuse requirements according to manufacturer's recommendations and nameplate data for actual equipment to be installed.

3. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard data sheets including voltage and current ratings, interrupting ratings, time-current curves, and current limitation curves.

1. Spare Fuse Cabinet: Include dimensions.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Refer to Division 01 - Product Requirements, for additional provisions.

2. Extra Fuses: One set(s) of three for each type and size installed.

3. Fuse Pullers: One set(s) compatible with each type and size installed.

4. Spare Fuse Cabinet Keys: Two.

1.04 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Bussmann, a division of Eaton Corporation: www.cooperindustries.com.

B. Littelfuse, Inc: www.littelfuse.com.

C. Substitutions: Refer to Division 01 - Product Requirements.

2.02 FUSES

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless specifically indicated to be excluded, provide fuses for all fusible equipment for a complete operating system.

C. Provide fuses of the same type, rating, and manufacturer within the same switch.

D. Comply with UL 248-1.

E. Unless otherwise indicated, provide cartridge type fuses complying with NEMA FU 1, Class and ratings as indicated.

F. Voltage Rating: Suitable for circuit voltage.

G. Class R Fuses: Comply with UL 248-12.

1. Class RK1, Time-Delay Fuses.

2. Class RK5, Time-Delay Fuses.

H. Provide the following accessories where indicated or where required to complete installation:

1. Fuseholders: Compatible with indicated fuses.

2. Fuse Reducers: For adapting indicated fuses to permit installation in switch designed for fuses with larger ampere ratings.

2.03 SPARE FUSE CABINET

A. Description: Wall-mounted sheet metal cabinet with shelves and hinged door with cylinder lock, suitably sized to store spare fuses and fuse pullers specified.

B. Finish: Manufacturer's standard, factory applied grey finish unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that fuse ratings are consistent with circuit voltage and manufacturer's recommendations and nameplate data for equipment.

B. Verify that mounting surfaces are ready to receive spare fuse cabinet.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Do not install fuses until circuits are ready to be energized.

B. Install fuses with label oriented such that manufacturer, type, and size are easily read.

C. Install spare fuse cabinet where indicated.

D. Identify spare fuse cabinet in accordance with Section 26 0553.

END OF SECTION

SECTION 26 2816.13 - ENCLOSED CIRCUIT BREAKERS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; 2013e (Amended 2017).
B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2017.
E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
H. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.
I. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.
J. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.
K. UL 1053 - Ground-Fault Sensing and Relaying Equipment; Current Edition, Including All Revisions.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted enclosed circuit breakers where indicated.
   4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
   5. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for circuit breakers, enclosures, and other installed components and accessories.
   1. Include characteristic trip curves for each type and rating of circuit breaker upon request.
C. Shop Drawings: Indicate outline and support point dimensions, voltage and current ratings, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
   1. Include dimensioned plan and elevation views of enclosed circuit breakers and adjacent equipment with all required clearances indicated.
   2. Include wiring diagrams showing all factory and field connections.
   3. Clearly indicate whether proposed short circuit current ratings are fully rated or, where acceptable, series rated systems.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
E. Project Record Documents: Record actual installed locations of enclosed circuit breakers.
F. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

1.04 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed circuit breaker internal components, enclosure, and finish.

1.06 FIELD CONDITIONS

A. Maintain ambient temperature between 23 degrees F and 104 degrees F during and after installation of enclosed circuit breakers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ABB/GE: www.geindustrial.com/#sle.
B. Eaton Corporation: www.eaton.com.
C. General Electric Company: www.geindustrial.com.
D. Schneider Electric; Square D Products: www.schneider-electric.us.
E. Siemens Industry, Inc: www.usa.siemens.com/#sle.
F. Substitutions: Refer to Division 01 - Product Requirements.
G. Source Limitations: Provide enclosed circuit breakers and associated components produced by same manufacturer as other electrical distribution equipment used for project and obtained from single supplier.

2.02 ENCLOSED CIRCUIT BREAKERS

A. Description: Units consisting of molded case circuit breakers individually mounted in enclosures.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet.
   2. Ambient Temperature: Between 23 degrees F and 104 degrees F.
D. Short Circuit Current Rating:
   1. Provide enclosed circuit breakers with listed short circuit current rating not less than the available fault current at the installed location indicated on the drawings.
   2. Listed series ratings are acceptable except where not permitted by motor contribution according to NFPA 70.
   3. Label equipment utilizing series ratings by NFPA 70.
E. Enclosed Circuit Breakers Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.
F. Conductor Terminations: Suitable for use with the conductors to be installed.
G. Provide thermal magnetic circuit breakers unless otherwise indicated.
H. Provide electronic trip circuit breakersfor circuit breaker frame sizes 225 amperes and above.
I. Provide insulated, groundable fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.
J. Enclosures: Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor Clean, Dry Locations: Type 1.
      b. Outdoor Locations: Type 3R.
K. Provide externally operable handle with means for locking in the OFF position.
L. Ground Fault Protection: Where ground-fault protection is indicated, provide system listed and labeled as complying with UL 1053.
   1. Where electronic circuit breakers equipped with integral ground fault protection are used, provide separate neutral current sensor where applicable.
   2. Where accessory ground fault sensing and relaying equipment is used, equip companion circuit breakers with ground-fault shunt trips.
      a. Use zero sequence ground fault detection method unless otherwise indicated.
      b. Provide test panel and field-adjustable ground fault pick-up and delay settings.
      c. Provide zone selective interlocking capability where indicated, capable of communicating with other electronic trip circuit breakers and external ground fault sensing systems to control ground fault delay functions for system coordination purposes.
M. Selectivity: Where the requirement for selectivity is indicated, furnish products to achieve selective coordination.

2.03 MOLDED CASE CIRCUIT BREAKERS

A. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.
B. Interrupting Capacity:
   1. Provide circuit breakers with interrupting capacity to provide the short circuit current rating indicated, but not less than:
      a. 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.
   2. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
   3. Series Rated Systems: Provide circuit breakers listed in combination with upstream devices to provide interrupting rating not less than the short circuit current rating indicated.
C. Conductor Terminations:
   1. Provide mechanical lugs unless otherwise indicated.
   2. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
D. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
   1. Provide field-adjustable magnetic instantaneous trip setting for circuit breaker frame sizes 225 amperes and larger.
   2. Provide interchangeable trip units where indicated.
E. Electronic Trip Circuit Breakers: Furnish solid state, microprocessor-based, true rms sensing trip units.
   1. Provide the following field-adjustable trip response settings:
      a. Long time pickup, adjustable by replacing interchangeable trip unit or by setting dial.
      b. Long time delay.
      c. Short time pickup and delay.
      d. Instantaneous pickup.
      e. Ground fault pickup and delay where ground fault protection is indicated.
   2. Provide zone selective interlocking capability where indicated, capable of communicating with other electronic trip circuit breakers and external ground fault sensing systems to control short time delay and ground fault delay functions for system coordination purposes.
   3. Provide communication capability where indicated: Compatible with system indicated.
F. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.

G. Provide the following circuit breaker types where indicated:
   1. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.
   2. Ground Fault Equipment Protection Circuit Breakers: Designed to trip at 30 mA for protection of equipment.
H. Provide listed switching duty rated circuit breakers with SWD marking for all branch circuits serving fluorescent lighting.
I. Provide listed high intensity discharge lighting rated circuit breakers with HID marking for all branch circuits serving HID lighting.
J. Provide the following features and accessories where indicated or where required to complete installation:
   1. Shunt Trip: Provide coil voltage for connection to indicated trip actuator.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that the ratings of the enclosed circuit breakers are consistent with the indicated requirements.
C. Verify that mounting surfaces are ready to receive enclosed circuit breakers.
D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
D. Provide required support and attachment in accordance with Section 26 0529.
E. Install enclosed circuit breakers plumb.
F. Install flush-mounted enclosed circuit breakers so that trims fit completely flush to wall with no gaps and rough opening completely covered.
G. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed circuit breakers such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
H. Provide grounding and bonding in accordance with Section 26 0526.
I. Set field-adjustable ground fault protection pickup and time delay settings as indicated.

3.03 FIELD QUALITY CONTROL

A. Refer to Division 01 - Quality Requirements, for additional requirements.
B. Inspect and test in accordance with manufacturer's instructions and NETA ATS, except Section 4.
C. Perform inspections and tests listed in NETA ATS, Section 7.6.1.1for circuit breakers used for service entrance and for circuit breakers larger than 400 amperes. Tests listed as optional are not required.
   1. Perform insulation-resistance tests on all control wiring with respect to ground.
   2. Test functions of the trip unit by means of secondary injection.
D. Ground Fault Protection Systems: Test in accordance with manufacturer's instructions by NFPA 70.
E. Test GFCI circuit breakers to verify proper operation.
F. Test shunt trips to verify proper operation.
G. Correct deficiencies and replace damaged or defective enclosed circuit breakers.

3.04 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING

A. Clean dirt and debris from circuit breaker enclosures and components according to manufacturer's instructions.
B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

SECTION 26 2816.16 - ENCLOSED SWITCHES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Enclosed safety switches.

1.02 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
B. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
C. NEMA BS 31047 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum); 2013 (Reaffirmed 2023).
D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2017.
E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
H. UL 98 - Enclosed and Dead-Front Switches; Current Edition, Including All Revisions.
I. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
   4. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for enclosed switches and other installed components and accessories.
C. Shop Drawings: Indicate outline and support point dimensions, voltage and current ratings, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
   1. Include dimensioned plan and elevation views of enclosed switches and adjacent equipment with all required clearances indicated.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
E. Project Record Documents: Record actual locations of enclosed switches.
F. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.
G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Refer to Division 01 - Product Requirements, for additional provisions.
   2. See Section 26 2813 for requirements for spare fuses and spare fuse cabinets.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.
B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed switch internal components, enclosure, and finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ABB/GE: www.geindustrial.com/#sle.
B. Eaton Corporation: www.eaton.com.
C. General Electric Company: www.geindustrial.com.
D. Schneider Electric; Square D Products: www.schneider-electric.us.
E. Siemens Industry, Inc: www.usa.siemens.com.
F. Substitutions: Refer to Division 01 - Product Requirements.
G. Source Limitations: Provide enclosed switches and associated components produced by same manufacturer as other electrical distribution equipment used for project and obtained from single supplier.

2.02 ENCLOSED SAFETY SWITCHES

A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:

1. Altitude: Less than 6,600 feet.
2. Ambient Temperature: Between -22 degrees F and 104 degrees F.

D. Horsepower Rating: Suitable for connected load.
E. Voltage Rating: Suitable for circuit voltage.
F. Short Circuit Current Rating:
1. Provide enclosed safety switches, when protected by the fuses or supply side overcurrent protective devices to be installed, with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.
2. Minimum Ratings:
a. Heavy Duty Single Throw Switches Protected by Class R, Class J, Class L, or Class T Fuses: 200,000 rms symmetrical amperes.

G. Enclosed Safety Switches Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.
H. Provide with switch blade contact position that is visible when the cover is open.
I. Fuse Clips for Fusible Switches: As required to accept fuses indicated.
1. Where NEMA Class R fuses are installed, provide rejection feature to prevent installation of fuses other than Class R.

J. Conductor Terminations: Suitable for use with the conductors to be installed.
K. Provide insulated, groundable fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.
L. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.
M. Enclosures: Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E.
1. Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
a. Indoor Clean, Dry Locations: Type 1.
b. Outdoor Locations: Type 3R.
2. Finish for Painted Steel Enclosures: Where exposed, color as selected by architect unless otherwise indicated.

N. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.
O. Heavy Duty Switches:
1. Comply with NEMA BS 31047.
2. Conductor Terminations:
a. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

P. Provide the following features and accessories where indicated or where required to complete installation:
1. Hubs: As required for environment type; sized to accept conduits to be installed.
2. Integral fuse pullers.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that field measurements are as indicated.
B. Verify that the ratings of the enclosed switches are consistent with the indicated requirements.
C. Verify that mounting surfaces are ready to receive enclosed safety switches.
D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
D. Provide required support and attachment in accordance with Section 26 0529.
E. Install enclosed switches plumb.
F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
G. Provide grounding and bonding in accordance with Section 26 0526.
H. Provide fuses complying with Section 26 2813 for fusible switches as indicated by equipment manufacturer's recommendations.
I. Identify enclosed switches in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL
A. Refer to Division 01 - Quality Requirements, for additional requirements.
B. Inspect and test in accordance with NETA ATS, except Section 4.
C. Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.
D. Correct deficiencies and replace damaged or defective enclosed safety switches or associated components.

3.04 ADJUSTING
A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING
A. Clean dirt and debris from switch enclosures and components according to manufacturer's instructions.
B. Repair scratched or marred exterior surfaces to match original factory finish. Where exposed to view, subcontract GC to paint (before mounting) to match adjacent finish.

END OF SECTION

SECTION 26 4300 - SURGE PROTECTIVE DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surge protective devices for service entrance locations.

1.02 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
B. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
D. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Include detailed component information, voltage, surge current ratings, repetitive surge current capacity, voltage protection rating (VPR) for all protection modes, maximum continuous operating voltage (MCOV), nominal discharge current (I-n), short circuit current rating (SCCR), connection means including any required external overcurrent protection, enclosure ratings, outline and support point dimensions, weight, service condition requirements, and installed features.

1.04 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Factory-installed, Internally Mounted Surge Protective Devices:
   1. Same as manufacturer of equipment containing surge protective device, to provide a complete listed assembly including SPD.

2.02 SURGE PROTECTIVE DEVICES - GENERAL REQUIREMENTS

A. Description: Factory-assembled surge protective devices (SPDs) for 60 Hz service; listed, classified, and labeled as suitable for the purpose intended; system voltage as indicated on the drawings.
B. Unless otherwise indicated, provide field-installed, externally-mounted or factory-installed, internally-mouonted SPDs.
C. List and label as complying with UL 1449, Type 1 when connected on line side of service disconnect overcurrent device and Type 1 or 2 when connected on load side of service disconnect overcurrent device.
D. Protected Modes:
E. UL 1449 Voltage Protection Ratings (VPRs).
F. UL 1449 Maximum Continuous Operating Voltage (MCOV): Not less than 115% of nominal system voltage.
G. Enclosure Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations.
H. Equipment Containing Factory-installed, Internally Mounted SPDs: Listed and labeled as a complete assembly including SPD.

2.03 SURGE PROTECTIVE DEVICES FOR SERVICE ENTRANCE LOCATIONS

A. Unless otherwise indicated, provide field-installed, externally mounted or factory-installed, internally mounted SPDs.
B. List and label as complying with UL 1449, Type 1 when connected on line side of service disconnect overcurrent device and Type 1 or 2 when connected on load side of service disconnect overcurrent device.
C. Provide SPDs utilizing field-replaceable modular or non-modular protection circuits.
D. Surge Current Rating: Not less than 120 kA per mode/240 kA per phase.
E. UL 1449 Nominal Discharge Current (I-n): 20 kA.
F. UL 1449 Short Circuit Current Rating (SCCR): Not less than the available fault current at the installed location as indicated on the drawings.
G. Diagnostics:
   1. Protection Status Monitoring: Provide indicator lights to report the protection for each phase.
   2. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that the service voltage and configuration marked on the SPD are consistent with the service voltage and configuration at the location to be installed.
C. Verify that electrical equipment is ready to accept connection of the SPD and that installed overcurrent device is consistent with requirements of drawings and manufacturer's instructions.
D. Verify system grounding and bonding is in accordance with Section 26 0526, including bonding of neutral and ground for service entrance and separately derived systems where applicable. Do not energize SPD until deficiencies have been corrected.
E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship).
B. Install products in accordance with manufacturer's instructions.
C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
D. Unless indicated otherwise, connect service entrance surge protective device on load side of service disconnect main overcurrent device.

E. Provide conductors with minimum ampacity as indicated on the drawings, as required by NFPA 70, and not less than manufacturer's recommended minimum conductor size.
F. Install conductors between SPD and equipment terminations as short and straight as possible, not exceeding manufacturer's recommended maximum conductor length. Breaker locations may be reasonably rearranged in order to provide leads as short and straight as possible. Twist conductors together to reduce inductance.
G. Do not energize SPD until bonding of neutral and ground for service entrance and separately derived systems is complete in accordance with Section 26 0526 where applicable. Replace SPDs damaged by improper or missing neutral-ground bond.
H. Disconnect SPD prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPD connected.

END OF SECTION

SECTION 26 5100 - INTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior luminaires.
B. Emergency lighting units.
C. Exit signs.
D. Ballasts and drivers.
E. Lamps.

1.02 REFERENCE STANDARDS

A. IES LM-79 - Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products; 2019.
B. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules; 2019.
C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
D. NECA/IESNA 500 - Standard for Installing Indoor Lighting Systems; 2006.
E. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; 2006.
F. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2012 (Reaffirmed 2018).
G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
H. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
I. UL 924 - Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.
J. UL 935 - Fluorescent-Lamp Ballasts; Current Edition, Including All Revisions.
K. UL 1598 - Luminaires; Current Edition, Including All Revisions.
L. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the installation of luminaires with mounting surfaces installed under other sections. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
   2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections .
   3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections.
   4. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.
B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.07 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.08 WARRANTY

A. Refer to Division 01 - Closeout Submittals, for additional warranty requirements.
B. Provide 3-year manufacturer warranty for LED luminaires, including drivers.
C. Provide 2-year manufacturer warranty for linear fluorescent ballasts.
D. Provide 5-year pro-rata warranty for batteries for emergency lighting units.
E. Provide 10-year pro-rata warranty for batteries for self-powered exit signs.
F. Provide 3-year full warranty for fluorescent emergency power supply units.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.
B. Substitutions: Refer to Division 01 - Product Requirements except where individual luminaire types are designated with substitutions not permitted.

2.02 LUMINAIRES

A. Manufacturers:
   1. Acuity Brands, Inc: www.acuitybrands.com/#sle.

2. Cooper Lighting, a division of Cooper Industries: www.cooperindustries.com/#sle.
3. Hubbell Lighting, Inc; _____: www.hubbelllighting.com/#sle.
4. Lutron Electronics Company, Inc; _____: www.lutron.com/#sle.
5. Philips Lighting North America Corporation; www.lightingproducts.philips.com/#sle.
6. Progress.
7. Substitutions: Refer to Division 01 - Product Requirements.

B. Provide products that comply with requirements of NFPA 70.
C. Provide products that are listed and labeled as complying with UL 1598, where applicable.
D. Provide products listed, classified, and labeled as suitable for the purpose intended.
E. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
F. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
G. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
H. Provide (1) extra of each type Common area and resident fixtures.
I. Recessed Luminaires:
1. Ceiling Compatibility: Comply with NEMA LE 4.
2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.
3. Luminaires Recessed in Sloped Ceilings: Provide suitable sloped ceiling adapters.

J. Fluorescent Luminaires:
1. Provide ballast disconnecting means complying with NFPA 70 where required.
2. Fluorescent Luminaires Controlled by Occupancy Sensors: Provide programmed start ballasts.
3. Fluorescent Luminaires Controlled by Dual-Level Switching: Provide with two ballasts.

K. LED Luminaires:
1. Components: UL 8750 recognized or listed as applicable.
2. Tested in accordance with IES LM-79 and IES LM-80.
3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

L. LED Luminaire Components: UL 8750 recognized or listed as applicable.
M. Track Lighting Systems: Provide track compatible with specified track heads, with all connectors, power feed fittings, dead ends, hangers and canopies as necessary to complete installation.
N. Luminaires Mounted in Continuous Rows: Provide quantity of units required for length indicated, with all accessories required for joining and aligning.

2.03 EMERGENCY LIGHTING UNITS
A. Manufacturers:
1. Acuity Brands, Inc: www.acuitybrands.com.
2. Cooper Lighting, a division of Cooper Industries: www.cooperindustries.com.
3. Hubbell Lighting, Inc: www.hubbelllighting.com.
4. Substitutions: Refer to Division 01 - Product Requirements.

B. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
C. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
D. Battery:
1. Size battery to supply all connected lamps, including emergency remote heads where indicated.

E. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
F. Provide low-voltage disconnect to prevent battery damage from deep discharge.

2.04 EXIT SIGNS
A. Description: Exit signs and similar signs for special purpose applications such as area of refuge/rescue assistance.
B. Description: Exit signs complying with NFPA 101 and applicable state and local codes, and listed and labeled as complying with UL 924.
1. Number of Faces: Single- or double-face as indicated for installed location.
2. Directional Arrows: As indicated for installed location.

2.05 BALLASTS AND DRIVERS
A. Ballasts/Drivers - General Requirements:
1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.

2.06 LAMPS
A. Manufacturers:
1. General Electric Company/GE Lighting: www.gelighting.com.
2. Osram Sylvania: www.sylvania.com.
3. Philips Lighting North America Corporation: www.usa.lighting.philips.com/#sle.

4. Philips Lighting Company: www.lighting.philips.com.
5. Substitutions: Refer to Division 01 - Product Requirements.

B. Lamps - General Requirements:
1. Unless explicitly excluded, provide new, compatible, operable lamps in each luminaire.
2. Verify compatibility of specified lamps with luminaires to be installed. Where lamps are not specified, provide lamps per luminaire manufacturer's recommendations.
3. Minimum Efficiency: Provide lamps complying with all current applicable federal and state lamp efficiency standards.
4. Color Temperature Consistency: Unless otherwise indicated, for each type of lamp furnish products which are consistent in perceived color temperature. Replace lamps that are determined by the Architect to be inconsistent in perceived color temperature.
5. Provide (1) box (6) lamps/bulbs of each type.

C. Lamps - Sustainable Design Requirements:
1. Maximum Mercury Content:
a. T8 Linear Fluorescent, 96 Inch: 10 mg.
b. T8 Linear Fluorescent, 48 Inch: 3.5 mg.
c. T8 Linear Fluorescent, 36 Inch and 24 Inch: 3.5 mg.
d. T8 Linear Fluorescent, U-Bent: 6 mg.
e. T5 Linear Fluorescent: 2.5 mg.
f. T5 Circular Fluorescent: 9 mg.
g. Compact Fluorescent, Nonintegral Ballast: 3.5 mg.
h. Compact Fluorescent, Integral Ballast: 3.5 mg (ENERGY STAR qualified).
i. High Pressure Sodium, Up to 400 W: 10 mg.
j. High Pressure Sodium, Greater Than 400 W: 32 mg.
2. Minimum Rated Lamp Life:
a. T8 Linear Fluorescent, 96 Inch: 24,000 hours for standard output lamps on instant start ballasts; 18,000 hours for high output lamps on instant start or programmed start ballasts; based on three hours per start.
b. T8 Linear Fluorescent, 48 Inch: 30,000 hours for standard and high output lamps on instant start ballasts; 36,000 hours on programmed start ballasts; based on three hours per start.
c. T8 Linear Fluorescent, 36 Inch and 24 Inch: 24,000 hours on instant start or programmed start ballasts; based on three hours per start.
d. T8 Linear Fluorescent, U-Bent: 18,000 hours on instant start ballasts; 24,000 hours on programmed start ballasts; based on three hours per start.
e. T5 Linear Fluorescent: 25,000 hours for standard and high output lamps on programmed start ballasts.
f. T5 Circular Fluorescent: 25,000 hours for standard and high output lamps on programmed start ballasts.
g. Compact Fluorescent, Nonintegral Ballast: 12,000 hours.
h. Compact Fluorescent, Integral Ballast: 10,000 hours for bare bulbs; 8,000 hours for covered models such as globes, reflectors, and A-19 lamps.
i. High Pressure Sodium: Use only non-cycling type lamps.

D. Linear Fluorescent Lamps: Wattage and bulb type as indicated, with base type for luminaire.
1. Low Mercury Content: Provide lamps that pass the EPA Toxicity Characteristic Leaching Procedure (TCLP) test for characteristic hazardous waste.
2. T8 Linear Fluorescent Lamps:
a. Correlated Color Temperature (CCT): 3,500 K unless otherwise indicated.
b. Color Rendering Index (CRI): Not less than 80.
c. Average Rated Life: Not less than 20,000 hours for an operating cycle of three hours per start.
3. T5 Linear Fluorescent Lamps:
a. Correlated Color Temperature (CCT): 3,500 K unless otherwise indicated.
b. Color Rendering Index (CRI): Not less than 80.
c. Average Rated Life: Not less than 20,000 hours for an operating cycle of three hours per start.

E. LED (Light Emitting Diode) Lamps
1. Correlated Color Temperature (CCT): 3,000 K unless otherwise indicated.
2. Color Rendering Index (CRI): Not less than 80.
3. Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that field measurements are as indicated.
B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
C. Verify that suitable support frames are installed where required.
D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION
A. Provide extension rings to bring outlet boxes flush with finished surface.
B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 26 0533.16 for installation of luminaires provided under this section.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Install products in accordance with manufacturer's instructions.
D. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).
E. Provide required support and attachment in accordance with Section 26 0529.
F. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
G. Suspended Ceiling Mounted Luminaires:
    1. Do not use ceiling tiles to bear weight of luminaires.
    2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
    3. Secure surface-mounted and recessed luminaires to ceiling support channels or framing members or to building structure.
    4. Secure pendant-mounted luminaires to building structure.
    5. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
    6. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.
H. Recessed Luminaires:
    1. Install trims tight to mounting surface with no visible light leakage.
    2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.
    3. Luminaires Recessed in Fire-Rated Ceilings: Install using accessories and firestopping materials to meet regulatory requirements for fire rating.
I. Suspended Luminaires:
    1. Unless otherwise indicated, specified mounting heights are to bottom of luminaire.
    2. Install using the suspension method indicated, with support lengths and accessories for specified mounting height.
    3. Provide minimum of two supports for each luminaire equal to or exceeding 4 feet nominal length, with no more than 4 feet between supports.
    4. Install canopies tight to mounting surface.
    5. Unless otherwise indicated, support pendants from swivel hangers.
J. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.
K. Install accessories furnished with each luminaire.
L. Bond products and metal accessories to branch circuit equipment grounding conductor.
M. Fluorescent Luminaires Controlled by Dual-Level Switching: Connect such that each switch controls the same corresponding lamps in each luminaire.
N. Emergency Lighting Units:
    1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
    2. For every 10 fixtures installed, include 1 spare fixture with wiring and installation labor.
    3. Install lock-on device on branch circuit breaker serving units.
O. Exit Signs:
    1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
    2. For every 10 fixtures installed, include 1 spare fixture with wiring and installation labor.
    3. Install lock-on device on branch circuit breaker serving units.
P. Install lamps in each luminaire.

3.04 FIELD QUALITY CONTROL
A. Refer to Division 01 - Quality Requirements, for additional requirements.
B. Inspect each product for damage and defects.
C. Operate each luminaire after installation and connection to verify proper operation.
D. Test self-powered exit signs, emergency lighting units, and fluorescent emergency power supply units to verify proper operation upon loss of normal power supply.
E. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

3.05 ADJUSTING
A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.
B. Aim and position adjustable emergency lighting unit lamps to achieve optimum illumination of egress path as directed by Architect or authority having jurisdiction.
C. Exit Signs with Field-Selectable Directional Arrows: Set as indicated to properly designate egress path as directed by Architect or authority having jurisdiction.

3.06 CLEANING
A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.07 CLOSEOUT ACTIVITIES
A. Refer to Division 01 - Closeout Submittals, for closeout submittals.

B. Refer to Division 01 - Demonstration and Training, for additional requirements.
C. Demonstration: Demonstrate proper operation of luminaires to Architect, and correct deficiencies or make adjustments as directed.
D. Just prior to Substantial Completion, replace all lamps that have failed.

3.08 PROTECTION

A. Protect installed luminaires from subsequent construction operations.

END OF SECTION

SECTION 26 5600 - EXTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior luminaires.
B. Ballasts.
C. Lamps.
D. Poles and accessories.
E. Luminaire accessories.

1.02 REFERENCE STANDARDS

A. AASHTO LTS - Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals; 2013 (Revised 2019).
B. IEEE C2 - National Electrical Safety Code; 2017.
C. IES LM-63 - IESNA Standard File Format for Electronic Transfer of Photometric Data and Related Information; 2002 (Reaffirmed 2008).
D. IES LM-79 - Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products; 2019.
E. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules; 2019.
F. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
G. NECA/IESNA 501 - Standard for Installing Exterior Lighting Systems; 2006.
H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
I. UL 1598 - Luminaires; Current Edition, Including All Revisions.
J. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate placement of poles and associated foundations with utilities, curbs, sidewalks, trees, walls, fences, striping, etc. installed under other sections. Coordinate elevation to obtain specified foundation height.
   2. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Shop Drawings:
   1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
   2. Provide photometric calculations where luminaires are proposed for substitution.
   3. Provide structural calculations for each pole proposed for substitution.
C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
   1. LED Luminaires:
      a. Include estimated useful life, calculated based on IES LM-80 test data.
      b. Include IES LM-79 test report upon request.
   2. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IES LM-63 standard format upon request.
   3. Lamps: Include rated life and initial and mean lumen output.
   4. Poles: Include information on maximum supported effective projected area (EPA) and weight for the design wind speed.
D. Sustainable Design Documentation: Submit manufacturer's product data on lamp mercury content and rated lamp life, showing compliance with specified requirements.
E. Samples:
   1. Provide one sample(s) of each luminaire proposed for substitution upon request.
   2. Provide one sample of each product finish illustrating color and texture upon request.
F. Certificates for Poles and Accessories: Manufacturer's documentation that products are suitable for the luminaires to be installed and comply with designated structural design criteria.
G. Field Quality Control Reports.
   1. Include test report indicating measured illumination levels.
H. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
I. Operation and Maintenance Data: Instructions for each product including information on replacement parts.
J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Refer to Division 01 - Product Requirements, for additional provisions.
   2. Extra Lamps: Ten percent of total quantity installed for each type, but not less than two of each type.
   3. Extra Ballasts: Two percent of total quantity installed for each type, but not less than one of each type.
   4. Extra Fuses: Five percent of total quantity installed for each type, but not less than two of each type.
   5. Touch-Up Paint: 2 gallons, to match color of pole finish.

K. Project Record Documents: Record actual connections and locations of pole foundations, luminaires, and any pull or junction boxes.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, handle, and store products according to NECA/IESNA 501 and manufacturer's written instructions.

B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.07 WARRANTY

A. Refer to Division 01 - Closeout Submittals, for additional warranty requirements.

B. Provide 2-year manufacturer warranty for all LED luminaires, including drivers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acuity Brands, Inc: www.acuitybrands.com.

B. Cooper Lighting, a division of Cooper Industries: www.cooperindustries.com.

C. Hubbell Lighting, Inc: www.hubbelllighting.com.

D. Progress Lighting.

2.02 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

B. Substitutions: Refer to Division 01 - Product Requirements.

2.03 LUMINAIRES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Provide luminaires listed and labeled as suitable for wet locations unless otherwise indicated.

H. LED Luminaires:

1. Components: UL 8750 recognized or listed as applicable.
2. Tested in accordance with IES LM-79 and IES LM-80.
3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

I. LED Luminaire Components: UL 8750 recognized or listed as applicable.

J. Exposed Hardware: Stainless steel.

2.04 LAMPS

A. Manufacturers:

1. General Electric Company/GE Lighting: www.gelighting.com.
2. Osram Sylvania: www.sylvania.com.
3. Philips Lighting Company: www.lighting.philips.com.
4. Substitutions: Refer to Division 01 - Product Requirements.
5. Manufacturer Limitations: Where possible, provide lamps produced by a single manufacturer.
6. Where a specific manufacturer or model is indicated elsewhere in the luminaire schedule or on the drawings, substitutions are not permitted unless explicitly indicated.

B. Lamps - General Requirements:

1. Unless explicitly excluded, provide new, compatible, operable lamps in each luminaire.
2. Verify compatibility of specified lamps with luminaires to be installed. Where lamps are not specified, provide lamps per luminaire manufacturer's recommendations.
3. Minimum Efficiency: Provide lamps complying with all current applicable federal and state lamp efficiency standards.
4. Color Temperature Consistency: Unless otherwise indicated, for each type of lamp furnish products which are consistent in perceived color temperature. Replace lamps that are determined by the Architect to be inconsistent in perceived color temperature.

2.05 POLES

A. All Poles:

1. Provide poles and associated support components suitable for the luminaire(s) and associated supports and accessories to be installed.
2. Structural Design Criteria:
   a. Comply with AASHTO LTS.
   b. Wind Load: Include effective projected area (EPA) of luminaire(s) and associated supports and accessories to be installed.
      1) Design Wind Speed: 110 miles per hour, with gust factor of 1.3.
   c. Dead Load: Include weight of proposed luminaire(s) and associated supports and accessories.
   d. Include structural calculations demonstrating compliance with submittals.
3. Material: Steel, unless otherwise indicated.
4. Shape: Square straight, unless otherwise indicated.

5. Finish: Match luminaire finish, unless otherwise indicated.
6. Mounting Height: 20', unless otherwise indicated.
7. Mounting: Install on concrete foundation, height as indicated on the drawings, unless otherwise indicated.
8. Unless otherwise indicated, provide with the following features/accessories:
    a. Top cap.
    b. Handhole, 2"w x 6"h size.
    c. Anchor bolts with leveling nuts or leveling shims.
    d. Anchor base cover.
    e. Provision for pole-mounted weatherproof GFI receptacle where indicated.
    f. Hinged base.
    g. Pole-top tenon, size for installed luminaire or bracket.

2.06 ACCESSORIES

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
C. Verify that suitable support frames are installed where required.
D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.
B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 26 0533.16 for installation of luminaires provided under this section.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Install products in accordance with manufacturer's instructions.
D. Install luminaires in accordance with NECA/IESNA 501.
E. Provide required support and attachment in accordance with Section 26 0529.
F. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
G. Recessed Luminaires:
    1. Install trims tight to mounting surface with no visible light leakage.
H. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.
I. Pole-Mounted Luminaires:
    1. Maintain the following minimum clearances:
        a. Comply with IEEE C2.
        b. Comply with utility company requirements.
    2. Foundation-Mounted Poles:
        a. Provide cast-in-place concrete foundations for poles as indicated, in accordance with Section 03 3000.
            1) Install anchor bolts plumb per template furnished by pole manufacturer.
            2) Position conduits to enter pole shaft.
        b. Install foundations plumb.
        c. Install poles plumb, using leveling nuts or shims to adjust to plumb.
        d. Tighten anchor bolt nuts to manufacturer's recommended torque.
        e. Install non-shrink grout between pole anchor base and concrete foundation, leaving small channel for condensation drainage.
        f. Install anchor base covers or anchor bolt covers as indicated.
    3. Embedded Poles: Install poles plumb as indicated.
    4. Grounding:
        a. Bond luminaires, metal accessories, metal poles, and foundation reinforcement to branch circuit equipment grounding conductor.
        b. Provide supplementary ground rod electrode as specified in Section 26 0526 at each pole bonded to grounding system as indicated.
    5. Install separate service conductors, 12 AWG copper, from each luminaire down to handhole for connection to branch circuit conductors.
    6. Install breakaway in-line fuse holders and fuses complying with Section 26 2813 in pole handhole or transformer base for each ungrounded conductor.
    7. Install weather resistant GFI duplex receptacle with weatherproof cover as specified in Section 26 2726 in designated poles.
J. Install accessories furnished with each luminaire.
K. Bond products and metal accessories to branch circuit equipment grounding conductor.
L. Install lamps in each luminaire.

3.04 FIELD QUALITY CONTROL

A. Refer to Division 01 - Quality Requirements, for additional requirements.
B. Inspect each product for damage and defects.
C. Operate each luminaire after installation and connection to verify proper operation.

D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.
E. Measure illumination levels at night with calibrated meters to verify compliance with performance requirements. Record test results in written report to be included with submittals.

3.05 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.
B. Luminaires with Field-Rotatable Optics: Position optics according to manufacturer's instructions to achieve lighting distribution as indicated or as directed by Architect.

3.06 CLEANING

A. Clean surfaces according to NECA/IESNA 501 and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.07 CLOSEOUT ACTIVITIES

A. Refer to Division 01 - Closeout Submittals, for closeout submittals.
B. Refer to Division 01 - Demonstration and Training, for additional requirements.
C. Demonstration: Demonstrate proper operation of luminaires to Architect, and correct deficiencies or make adjustments as directed.
D. Just prior to Substantial Completion, replace all lamps that have failed.

3.08 PROTECTION

A. Protect installed luminaires from subsequent construction operations.

END OF SECTION

SECTION 28 1000 - ACCESS CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Access control system requirements.
B. Access control units and software.
C. Access control point peripherals, including readers and keypads.
D. Accessories.
E. Access control devices.
F. Access control panel.
G. Access control software.

1.02 DEFINITIONS

A. Access Control Cloud Services: Subscription-based hosted application utilizing Software as a Service (SaaS) delivery model in lieu of on-premises servers/software.

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
C. UL 294 - Access Control System Units; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
1. Coordinate the work with other installers to provide suitable door hardware for both access control functionality and code compliance.
2. Coordinate the placement of readers with millwork, furniture, equipment, etc. installed under other sections.
3. Coordinate the work with other installers to provide power for equipment at required locations.
4. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Include plan views indicating locations of system components and proposed size, type, and routing of conduits and/or cables. Include elevations and details of proposed equipment arrangements. Include system interconnection schematic diagrams. Include requirements for interface with other systems.
C. Product Data: Provide manufacturer's standard catalog pages and data sheets for each system component. Include ratings, configurations, standard wiring diagrams, dimensions, finishes, service condition requirements, and installed features.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.
E. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.
1. Include contact information for entity that will be providing contract maintenance and trouble call-back service.
F. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Comply with the following:
1. NFPA 70.
2. The requirements of the local authorities having jurisdiction.
3. Applicable TIA/EIA standards.

1.07 WARRANTY

A. Refer to Division 01 - Closeout Submittals, for additional warranty requirements.
B. Provide minimum one year manufacturer warranty covering repair or replacement due to defective materials or workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Access Control Units:
1. Bosch Security Systems: www.boschsecurity.us.
2. Brivo: www.brivo.com.
3. **Basis of Design:** ButterflyMX System: www.butterflymx.com.
4. DoorKing, Inc: www.doorking.com.
5. Honeywell International, Inc: www.honeywellaccess.com.
6. Substitutions: See Section 01 6000 - Product Requirements.
B. Access Control Software:
1. Honeywell International, Inc: www.honeywellaccess.com.
C. Access Control Cloud Services:
1. Brivo: www.brivo.com/.
2. **Basis of Design:** ButterflyMX System: www.butterflymx.com.
3. Substitutions: See Section 01 6000 - Product Requirements.
D. Readers and Keypads:
1. Bosch Security Systems: www.boschsecurity.us.

2. Brivo: www.brivo.com.
3. **Basis of Design:** ButterflyMX System: www.butterflymx.com.
4. DoorKing, Inc: www.doorking.com.
5. Honeywell International, Inc: www.honeywellaccess.com.
6. Substitutions: See Section 01 6000 - Product Requirements.

E. Access Control System:
1. Bosch Security Systems: www.boschsecurity.us.
2. Brivo: www.brivo.com.
3. **Basis of Design:** ButterflyMX System: www.butterflymx.com.
4. Honeywell International, Inc: www.honeywellaccess.com.

F. Substitutions: Refer to Division 01 - Product Requirements.

G. Source Limitations: Where possible, furnish system components and accessories produced by single manufacturer and obtained from single supplier.

2.02 ACCESS CONTROL SYSTEM REQUIREMENTS

A. Provide new access control system consisting of required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the functional intent indicated.

B. System Battery Backup: Provide batteries/uninterruptible power supplies (UPS) for 60 minutes full operation.

C. Access Control Points:
1. Refer to drawings for peripheral device locations.

D. Interface with Other Systems:
1. Provide products compatible with other systems requiring interface with access control system.
2. Interface with electrically operated door hardware as specified in Section 08 7100.
   a. Capable of locking/unlocking/releasing controlled doors.
3. Interface with video surveillance system as specified in Section 28 2000.

E. Provide products listed, classified, and labeled as suitable for the purpose intended.
1. Access Control Units and Readers: Listed and labeled as complying with UL 294.
2. Exterior Doors: Control access into building.

2.03 Access Control Units and Software

A. Provide access control units and software compatible with readers to be connected.

B. Unless otherwise indicated, provide software and licenses required for fully operational system.

C. Access Control Unit:
1. Features:
   a. Dedicated power loss alarm input.
   b. Supports database and event exporting.
   c. Supports database backup.
   d. Integral backup battery system.

D. Computers:
1. Workstation Computers: Unless otherwise indicated, workstation computer hardware and associated peripherals not furnished by access control system manufacturer to be provided by others, meeting access control system equipment manufacturer's recommended requirements.
2. Servers: Unless otherwise indicated, server hardware and associated peripherals not furnished by access control system manufacturer to be provided by others, meeting access control system equipment manufacturer's recommended requirements.
3. Badging Peripherals: Unless otherwise indicated, badging peripherals not furnished by access control system manufacturer to be provided by others.

E. Software:
1. Unless otherwise indicated, provide all software and licenses required for fully operational system.
2. Access Control System:
3. Visitor Management System:

2.04 ACCESS CONTROL POINT PERIPHERALS

A. Provide devices compatible with control units and software.

B. Provide devices suitable for operation under the service conditions at the installed location.

C. Readers and Keypads:
1. General Requirements:
   a. Provide readers compatible with credentials to be used.
   b. Color: To be selected by Architect from manufacturer's available standard colors.

D. Proximity Readers:
1. Utilizes 125 kHz RF communication with compatible credentials.

E. Door Position Switches:
1. Magnetic Contacts: Encapsulated reed switch(es) and separate magnet; designed to monitor opened/closed position of doors.
2. Contact Color: To be selected by Architect from manufacturer's available standard colors.

F. Door Locking Devices (Electric Strikes and Magnetic Locks): Comply with Section 08 7100.

2.05 ACCESSORIES

A. Provide components as indicated for connection of access control system to devices and other systems indicated.

B. Unless otherwise indicated, credentials to be provided by Contractor.
1. Provide credentials compatible with readers and control units/software to be used.

C. Provide cables as indicated for connections between system components.
D. Provide accessory racks/cabinets as indicated for equipment mounting.
E. Security Access Control Panel.
F. Encoded Card Readers.
G. Encoded Cards/Fobs.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that ratings and configurations of system components are consistent with the indicated requirements.
C. Verify that mounting surfaces are ready to receive system components.
D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to system.
E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install access control system in accordance with NECA 1 (general workmanship).
B. Install products in accordance with manufacturer's instructions.
C. Wiring Method: Unless otherwise indicated, use cables (not in conduit).
    1. Use suitable listed cables in wet locations, including underground raceways.
    2. Use suitable listed cables for vertical riser applications.
    3. Use listed plenum rated cables in spaces used for environmental air.
    4. Install wiring in conduit for the following:
        a. Where required for rough-in.
        b. Where required by authorities having jurisdiction.
        c. Where exposed to damage.
        d. Where installed outside the building.
        e. For exposed connections from outlet boxes to devices.
    5. Conduit: Comply with Section 26 0533.13.
    6. Conceal cables unless specifically indicated to be exposed.
    7. Use power transfer hinges complying with Section 08 7100 for concealed connections to door hardware.
    8. Cables in the following areas may be exposed, unless otherwise indicated:
        a. Equipment closets.
    9. Route exposed cables parallel or perpendicular to building structural members and surfaces.
    10. Do not exceed manufacturer's recommended maximum cable length between components.
D. Provide grounding and bonding in accordance with Section 26 0526.
E. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
F. Identify system wiring and components in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.
B. Prepare and start system in accordance with manufacturer's instructions.
C. Program system parameters according to requirements of Owner.
D. Test for proper interface with other systems.
E. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.

3.04 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.05 CLOSEOUT ACTIVITIES

A. Refer to Division 01 - Closeout Submittals, for closeout submittals.
B. Refer to Division 01 - Demonstration and Training, for additional requirements.
C. Demonstration: Demonstrate proper operation of system to Owner, and correct deficiencies or make adjustments as directed.
D. Training: Train Owner's personnel on operation, adjustment, and maintenance of system.
    1. Use operation and maintenance manual as training reference, supplemented with additional training materials.
    2. Instructor: Manufacturer's authorized representative.
    3. Location: At project site.

3.06 PROTECTION

A. Protect installed system components from subsequent construction operations.

3.07 MAINTENANCE

A. Refer to Division 01 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
B. Provide to Owner, at no extra cost, a separate maintenance contract for the service and maintenance of access control system for two years from date of Substantial Completion; Include a complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with a detailed schedule.
C. Provide trouble call-back service upon notification by Owner:
    1. Include allowance for call-back service during normal working hours at no extra cost to Owner.
    2. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.

END OF SECTION

SECTION 28 2000 - VIDEO SURVEILLANCE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Video surveillance system requirements.
B. Video recording and viewing equipment.
C. Cameras.
D. Video management software.

1.02 REFERENCE STANDARDS

A. 47 CFR 15 - Radio Frequency Devices; current edition.
B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
C. NECA 303 - Standard for Installing and Maintaining Closed-Circuit Television (CCTV) Systems; 2019.
D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the placement of cameras with structural members, ductwork, piping, equipment, luminaires, diffusers, fire suppression system components, and other potential conflicts installed under other sections.
   2. Coordinate the work with other installers to provide power for cameras and equipment at required locations.
   3. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.04 SUBMITTALS

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Include plan views indicating locations of system components and proposed size, type, and routing of conduits and/or cables. Include elevations and details of proposed equipment arrangements. Include system interconnection schematic diagrams. Include requirements for interface with other systems.
C. Product Data: Provide manufacturer's standard catalog pages and data sheets for each system component. Include ratings, configurations, standard wiring diagrams, dimensions, finishes, service condition requirements, and installed features.
D. Design Data:
   1. Standby battery/UPS calculations.
   2. Video storage capacity calculations.
E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.
F. Manufacturer’s detailed field testing procedures.
G. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.
   1. Include contact information for entity that will be providing contract maintenance and trouble call-back service.
H. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.
I. Maintenance contracts.

1.05 QUALITY ASSURANCE

A. Comply with the following:
   1. NFPA 70.
   2. Applicable TIA/EIA standards.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience with video surveillance systems of similar size, type, and complexity and providing contract maintenance service as a regular part of their business; authorized manufacturer's representative.
D. Products: Furnish products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and indicated.

1.06 WARRANTY

A. Refer to Division 01 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Video Recording and Viewing Equipment - Basis of Design: Sony.
B. Video Recording and Viewing Equipment and Software:
   1. Bosch Security Systems: www.boschsecurity.us.
   2. Honeywell International, Inc: www.honeywellvideo.com.
   3. Pelco, a brand of Schneider Electric: www.pelco.com.
   4. S2.
   5. HANWHA
C. Cameras - Basis of Design: Sony.
D. Cameras:
   1. Bosch Security Systems: www.boschsecurity.us.
   2. Honeywell International, Inc: www.honeywellvideo.com.
   3. Pelco, a brand of Schneider Electric: www.pelco.com.

4. S2.
5. HANWHA

E. Substitutions: Refer to Division 01 - Product Requirements.

F. Video Management System:
1. Bosch Security Systems: www.boschsecurity.us.
2. S2.

2.02 VIDEO SURVEILLANCE SYSTEM

A. Provide new video surveillance system consisting of all required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the functional intent indicated.

B. System Description: IP system with connection to network (IP) cameras.
1. Video Storage Capacity: Suitable for storing video from all cameras for 30 days.
2. System Battery Backup: Provide batteries/uninterruptible power supplies (UPS) for 120 minutes full operation.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Electromagnetic Interference/Radio Frequency Interference (EMI/RFI) Limits: Comply with FCC requirements of 47 CFR 15, for Class B, consumer application.

2.03 CAMERAS

A. Provide cameras and associated accessories suitable for operation under the service conditions at the installed location. Provide additional components (e.g. enclosures, heaters, blowers, etc.).

B. Where not factory-installed, provide additional components (e.g. lenses, mounting accessories, etc.) as necessary for complete installation.

C. Network (IP) Cameras:
1. Signal-to-Noise Ratio: Not less than 50 dB.
2. Provide the following standard features:
a. Automatic electronic shutter.
b. Automatic gain control.
c. Automatic white balance.
d. Web-based interface for remote viewing and setup.
e. Password protected security access.
3. Network (IP) Indoor Fixed Dome Camera:
a. Camera Type: True day/night with IR cut filter.
b. Image Sensor: 1/4 inch CMOS.
c. Resolution: Up to 1080p (1920 x 1080).
d. Frame Rate: Up to 30 frames per second (fps) at all available resolutions.
e. Minimum Illumination: 3 lux color, .1 lux black and white.

2.04 ACCESSORIES

A. Provide components as indicated for connection of video surveillance system to devices and other systems indicated.

B. Provide components as indicated for system power and network connections.

C. Provide cables as indicated for connections between system components.
1. Data Cables for IP Network Connections: Unshielded twisted pair (UTP), minimum Category 5e, complying with Section 27 1000.
2. Analog Video Connections:
a. Coaxial Cables: Copper center conductor and 95 percent bare copper braid shield, minimum RG59/U.
b. Coaxial Connectors: BNC crimp-on type.

D. Provide accessory racks/cabinets as indicated for equipment mounting.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install video surveillance system in accordance with NECA 1 (general workmanship) and NECA 303.

B. Install products in accordance with manufacturer's instructions.

C. Provide required support and attachment in accordance with Section 26 0529.

D. Wiring Method: Unless otherwise indicated, use cables (not in conduit).
1. Use suitable listed cables in wet locations, including underground raceways.
2. Use suitable listed cables for vertical riser applications.
3. Use listed plenum rated cables in spaces used for environmental air.
4. Install wiring in conduit for the following:
a. Where required for rough-in.
b. Where required by authorities having jurisdiction.
c. Where exposed to damage.
d. Where installed outside the building.
e. For exposed connections from outlet boxes to cameras.
5. Conduit: Comply with Section 26 0533.13.
6. Conceal all cables unless specifically indicated to be exposed.
7. Cables in the following areas may be exposed, unless otherwise indicated:
a. Equipment closets.
8. Route exposed cables parallel or perpendicular to building structural members and surfaces.

E. Provide grounding and bonding in accordance with Section 26 0526.

F. Identify system wiring and components in accordance with Section 26 0553.

3.02 FIELD QUALITY CONTROL

A. Refer to Division 01 - Quality Requirements, for additional requirements.
B. Provide services of a manufacturer's authorized representative to observe installation and assist in inspection and testing. Include manufacturer's detailed testing procedures and field reports with submittals.
C. Prepare and start system in accordance with manufacturer's instructions.
D. Adjust cameras to provide desired field of view and produce suitable images under all service lighting conditions.
E. Program system parameters according to requirements of Owner.
F. Test for proper interface with other systems.
G. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.

3.03 CLOSEOUT ACTIVITIES

A. Refer to Division 01 - Closeout Submittals, for closeout submittals.
B. Refer to Division 01 - Demonstration and Training, for additional requirements.
C. Demonstration: Demonstrate proper operation of system to Owner, and correct deficiencies or make adjustments as directed.
D. Training: Train Owner's personnel on operation, adjustment, and maintenance of system.
    1. Use operation and maintenance manual as training reference, supplemented with additional training materials.

3.04 MAINTENANCE

A. Refer to Division 01 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
B. Provide to Owner, at no extra cost, a separate maintenance contract for the service and maintenance of video surveillance system for two years from date of Substantial Completion; Include a complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with a detailed schedule.
C. Provide trouble call-back service upon notification by Owner:
    1. Include allowance for call-back service during normal working hours at no extra cost to Owner.
    2. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.

END OF SECTION

SECTION 28 4600 - FIRE DETECTION AND ALARM

PART 1 GENERAL

1.01 Section Includes

A. Fire alarm system and associated components, including control units, related equipment, initiating devices, and notification appliances.

1.02 Reference Standards

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
C. IEEE C62.41.2 - IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (Corrigendum 2012).
D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
E. NFPA 72 - National Fire Alarm and Signaling Code; Most Recent Edition Cited by Referring Code or Reference Standard.
F. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2021.
G. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
H. UL 864 - Standard for Control Units and Accessories for Fire Alarm Systems.
I. UL 268 - Standard for Smoke Detectors for Fire Alarm Systems; Current Edition, Including All Revisions.
J. UL 864 - Control Units and Accessories for Fire Alarm Systems; Current Edition, Including All Revisions.

1.03 Submittals

A. Refer to Division 01 - Administrative Requirements, for submittal procedures.
B. Evidence of designer qualifications.
C. Comply with NFPA 72 chapter "Documentation," including noting names of installers, owners, and system classification information.
D. Design Documents: Submit all information required for plan review and permitting by AHJ, including floor plans, riser diagrams, and description of operation.
    1. Copy (if any) of list of data required by AHJ.
    2. NFPA 72 "Record of Completion", filled out to extent known at time.
    3. Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix A, and complete listing of software required.
    4. Manufacturer's detailed product data sheet for each component, including wiring diagrams, and circuit length limitations. Catalog pages and product descriptions include ratings, dimensions, finishes, service conditions, and included features.
    5. Certification by manufacturer of FACU that system design complies with Contract Documents.
    6. Certification by Contractor that system design complies with Contract Documents.
E. Shop Drawings: Submit installation documentation required for plan review and permitting by AHJ, including floor plans showing locations of fire alarm system components, enlarged drawn to identified scale plan view, and riser diagrams.
    1. System zone boundaries and interfaces to fire safety systems.
    2. Show locations of components, circuits, and raceways; mark components with identifiers used in control unit programming.
    3. Include elevations and details of proposed equipment arrangements.
    4. Include system interconnection schematic riser diagram showing proposed and approved cable size and type; coordinated with floor plans and describing circuit class, survivability, and application specific information required by NFPA 72.
    5. Include typical wiring diagrams for devices, notification appliances, remote indicators, annunciators, remote test stations, and EoL and power supervisory devices.
    6. Include requirements and control diagrams for interfacing with other systems.
    7. Circuit layouts; number, size, and type of raceways and conductors; conduit fill calculations; standby and spare capacity calculations; notification appliance circuit loop resistance and voltage drop calculations, including spare capacity.
    8. List of devices and notification appliances on each SLC, with spare capacity indicated.
    9. Manufacturer's detailed data sheet for each component, including wiring diagrams, installation instructions, and circuit length limitations.
    10. Description of power supplies; if secondary power is by battery include calculations demonstrating adequate battery power.
    11. Detailed drawing of graphic annunciators, displays, and interfaces.
    12. Certification by either FACU manufacturer or manufacturer of related equipment.
    13. Certification by FACU manufacturer that system design complies with Contract Documents.
    14. Certification by Contractor that system design complies with Contract Documents.
F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
G. Evidence of installer qualifications.
H. Evidence of maintenance contractor qualifications, if different from installer.
I. Inspection and Test Reports:

1. Submit inspection and test plan prior to closeout demonstration.
2. Submit documentation of satisfactory inspections and tests.
3. Submit NFPA 72 "Inspection and Test," filled out.

J. Operating and Maintenance Data: Refer to Division 01 for additional requirements; revise and resubmit until acceptable; have one set available during closeout demonstration:
1. Complete set of specified design documents, as approved by AHJ.
2. Additional printed set of project record documents and closeout documents, bound or filed in same manuals.
3. Contact information for firm that will be providing contract maintenance and trouble call-back service.
4. List of recommended spare parts, tools, and instruments for testing.
5. Replacement parts list with current prices, and source of supply.
6. Detailed troubleshooting guide and large scale input/output matrix.
7. Preventive maintenance, inspection, and testing schedule complying with NFPA 72; provide printed copy and computer format acceptable to Owner.
8. Detailed but easy to read explanation of procedures require recording of system trouble events by qualified personnel, such as when routine testing is being conducted for fire drills and when entering into contracts for building renovations.
9. Video recorded copy of training sessions.

K. Project Record Documents: Refer to Division 01 for additional requirements; have one set available during closeout demonstration:
1. Complete set of floor plans showing actual installed locations of components, conduit, and zones.
2. "As installed" wiring and schematic diagrams, with final terminal identifications.
3. "As programmed" operating sequences, including control events by device, and updated input/output chart.

L. Closeout Documents:
1. Certification by manufacturer that system has been installed in compliance with manufacturer's installation requirements, is complete, and is in satisfactory operating condition.
2. NFPA 72 "Record of Completion," filled out completely and signed by installer and authorized representative of AHJ.
3. Certificate of Occupancy.
4. Maintenance contract.

M. Maintenance Materials, Tools, and Software: Furnish the following for Owner's use in maintenance of project.
1. Furnish spare parts of same manufacturer and model as those installed; deliver in original packaging, labeled in same manner as in operating and maintenance data and place in spare parts cabinet.
2. In addition to items in quantities indicated in PART 2, furnish the following:
a. Tools, software, and documentation necessary to modify fire alarm system using Owner's personnel; minimum modification capability to include addition and deletion of devices, notification appliances, circuits, and zones, and changes to system description, and operation.
b. One copy of software not resident in read-only-memory.

1.04 Quality Assurance

A. Designer Qualifications: NICET Level III (three) or Level IV (four) certified fire alarm technician or registered fire protection engineer, employed by FACU manufacturer, Contractor, or installer, with experience designing fire alarm systems in jurisdictional area of AHJ.

B. Installer Qualifications: Firm with minimum three years documented experience installing fire alarm systems of specified type and providing contract maintenance service as regular part of their business.
1. Authorized representative of FACU manufacturer; submit manufacturer's certification that installer is authorized; include name and title of manufacturer's representative making certification.
2. Installer Personnel: At least two years of experience installing fire alarm systems.
3. Supervisor: Level III (three) or Level IV (four) certified fire alarm technician; furnish name and address.

C. Manufacturer Qualifications: Company specialized in manufacturing products specified in this section with at least three years of documented experience.

D. Maintenance Contractor Qualifications: Same entity as installer or different entity with specified qualifications.

E. Instructor Qualifications: Experienced in technical instruction, understanding fire alarm theory, and able to provide the required training; trained by fire alarm control unit manufacturer.

1.05 Warranty

A. Refer to Division 01 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 Fire Alarm System

A. General Requirements:
1. Provide new fire alarm system complying with NFPA 70, NFPA 72, NFPA 90A, and consisting of required equipment, conduit, cabinets, outlet boxes, wiring, connectors, hardware, supports, accessories, components, software, and system programming as necessary for complete operating system that provides functional intent indicated.
2. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:
a. 36 CFR 1191 and ADA Standards.
b. Requirements of AHJ.
c. Applicable local codes.
d. Contract Documents.
e. NFPA 72; "should" is mandatory; where conflicts between requirements require deviation, identify deviations clearly on design documents.

3. Fire Alarm System Products:
   a. Listed, classified, and labeled as suitable for purpose intended.
   b. Installation Environments: Provide products suitable for their respective indoor and outdoor applications.
4. Provide fire alarm circuits in accordance with NFPA 70.
   a. Comply with methods of interconnecting FACUs in accordance with NFPA 72 and NFPA 70.
   b. Power Sources:
      1) Comply with requirements for power supplies of emergency systems in accordance with NFPA 70.
      2) Primary: Dedicated branch circuits from facility power distribution system.
      3) Secondary: Storage batteries with capacity to operate system for period specified by NFPA 72.
   c. Wiring and Wiring Methods:
      1) General Requirements:
         (a) Comply with requirements for wiring and wiring methods in accordance with NFPA 70.
         (b) Conductors and Cables Installed Exposed in Spaces Used for Environmental Air (only where specifically permitted): Plenum-rated, listed and labeled as suitable for use in return air plenums.
         (c) Special Occupancies: Comply with NFPA 70.
         (d) Comply with NFPA 70 for wire and cable plenum, riser, general-purpose, limited-use, undercarpet, and underground applications.
      2) Fire Alarm Circuits:
         (a) Comply with NFPA 70 for conditions and types required for multiconductor cable systems.
         (b) Non-Power-Limited Fire Alarm (NPLFA) Circuits:
            (1) Provide dedicated NPLFA non-GFCI branch circuits for fire alarm equipment and marked by red identification in accordance with NFPA 70.

         (c) Power-Limited Fire Alarm (PLFA) Circuits:
            (1) Provide identification for PLFA circuits in accordance with NFPA 70.

5. Provide pathway class designations and pathway survivability, as defined in NFPA 72.
   a. Provide monitoring of conductors and other signaling channels for integrity and circuit performance.
   b. Pathway Class Designations:
      1) Unless otherwise indicated or required, pathways to meet the following requirements:
         (a) SLCs: Class B (star, tee-tap, multi-tap, with no return).
         (b) IDCs: Class B (daisy-chain with EoL resistor device installed at end of circuit).
         (c) NACs: Class B (daisy-chain with EoL resistor device installed at end of circuit).

B. Fire Alarm System Interfaces and Control Functions:
   1. UL 864 listed unless otherwise indicated.
   2. Descriptions below are intended to provide means for interface. See project SOOs, narrative, and input/output matrix for execution requirements.
   3. Provide initiating devices, interfaces, and control functions for emergency control function interfaces in accordance with NFPA 72.
   4. Provide monitoring of interconnected systems. Coordinate notification appliance alternate markings as indicated on drawings.

2.02 MANUFACTURERS

A. Fire Alarm Control Units: Provided their products meet or exceed the performance of the basis of design product, products of the following are acceptable:
   1. Honeywell Security & Fire Solutions/Notifier: www.notifier.com.
   2. Honeywell Security & Fire Solutions/Silent Knight: www.silentknight.com.
   3. Siemens Building Technologies, Inc: www.usa.siemens.com.
   4. Simplex, a Tyco Business: www.simplex-fire.com.
   5. Edwards Division of United Technologies: www.edwardsfiresafety.com
   6. Provide all control units made by the same manufacturer.
B. Initiating Devices and Notification Appliances:
   1. Provide initiating devices and notification appliances from same manufacturer as the control unit(s).
C. Substitutions: Refer to Division 01 - Product Requirements.
   1. For substitution of products by manufacturers not listed, submit product data showing features and certification by Contractor that the design will comply with Contract Documents.

2.03 FIRE ALARM SYSTEM

A. Fire Alarm System: Provide a new automatic fire detection and alarm system:
   1. Provide all components necessary, regardless of whether shown in Contract Documents or not.
   2. Protected Premises: Entire building shown on drawings.
   3. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:
      a. ADA Standards.
      b. The requirements of the State Fire Marshal.
      c. The requirements of the local authority having jurisdiction.
      d. Applicable local codes.
      e. Contract Documents (drawings and specifications).
      f. NFPA 101.

g. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.
4. Evacuation Alarm: Multiple smoke zones; allow for evacuation notification of any individual zone or combination of zones, in addition to general evacuation of entire premises.
5. General Evacuation Zones: Each smoke zone is considered a general evacuation zone unless otherwise indicated, with alarm notification in all zones on the same floor, on the floor above, and the floor below.
6. Hearing Impaired Occupants: Provide visible notification devices in all public areas and in dwelling units.
7. Master Control Unit (Panel): New, located at supervising station.

B. Supervising Stations and Fire Department Connections:
1. Public Fire Department Notification: By remote supervising station.
2. Remote Supervising Station: UL-listed central station under contract to facility.
3. Means of Transmission to Remote Supervising Station: Digital alarm communicator transmitter (DACT), 2 telephone lines.

C. Circuits:
1. Initiating Device Circuits (IDC): Class B, Style A.
2. Signaling Line Circuits (SLC) Within Single Building: Class B, Style 0.5.
3. Notification Appliance Circuits (NAC): Class B, Style W.

D. Spare Capacity:
1. Initiating Device Circuits: Minimum 25 percent spare capacity.
2. Notification Appliance Circuits: Minimum 25 percent spare capacity.
3. Speaker Amplifiers: Minimum 25 percent spare capacity.
4. Fire Alarm Control Units: Capable of handling all circuits utilized to capacity without requiring additional components other than plug-in control modules.

E. Power Sources:
1. Primary: Dedicated branch circuits of the facility power distribution system.
2. Secondary: Storage batteries.
3. Capacity: Sufficient to operate entire system for period specified by NFPA 72.
4. Each Computer System: Provide uninterruptible power supply (UPS).

2.04 FIRE SAFETY SYSTEMS INTERFACES

A. Supervision: Provide supervisory signals in accordance with NFPA 72 for the following:
1. Sprinkler water control valves.
2. Dry-pipe sprinkler system pressure.
3. Dry-pipe sprinkler valve room low temperature.
4. Elevator shut-down control circuits.

B. Alarm: Provide alarm initiation in accordance with NFPA 72 and fire AHJ for the following:
1. Sprinkler water flow.
2. Kitchen hood suppression activation; also disconnect fuel source from cooking equipment.
3. Elevator lobby, elevator hoistway, and elevator machine room smoke detectors.

C. Elevators:
1. Elevator lobby, hoistway, and machine room smoke detectors: Elevator recall for fire fighters' service.
2. Elevator Machine Room Heat Detector: Shut down elevator power prior to hoistway sprinkler activation.
3. Sprinkler pressure or waterflow: Shut down elevator power prior to hoistway sprinkler activation.

D. HVAC:
1. Duct Smoke Detectors: Furnish with auxiliary contacts. Close dampers indicated; shut down air handlers indicated. Provide with smoke test port (Life Safety Test DSDS or approved equivalent).
2. DDC Building Automation System: provide logical interface for communication of alarm system status with device type and location activated during alarm event. In the event an area smoke detector is activated, the respective area air handling system shall shut down to prevent spread of smoke.
3. Combination fire smoke dampers: provide wiring from damper position switches and programming to indicate damper position during remote testing.
4. Smoke dampers: provide wiring from damper position switches and programming to indicate damper position during remote testing.

E. Doors:
1. Smoke Barrier Door Magnetic Holders: Release upon activation of smoke detectors in smoke zone on either side of door, upon alarm from manual pull station on same floor, and upon sprinkler activation on same floor. Refer to Section 08 7100.
2. Electromagnetic Door Locks on Egress Doors: Unlock upon activation of any alarm initiating device or suppression system in smoke zone that doors serve as egress from. Refer to Section 08 7100.

2.05 COMPONENTS

A. General:
1. Provide flush mounted units where installed in finished areas; in unfinished areas, surface mounted unit are acceptable.
2. Provide legible, permanent labels for each control device, using identification used in operation and maintenance data.

B. Fire Alarm Control Units, Initiating Devices, and Notification Appliances: Digital, addressable type; listed, classified, and labeled as suitable for the purpose intended.

C. Master Control Unit: _____.

D. Initiating Devices:

1. Manual Pull Stations: Provide 10% extra
2. Smoke Detectors: Provide 10% extra
3. Duct Smoke Detectors: Provide 10% extra
4. Heat Detectors: Provide 10% extra
5. Addressable Interface Devices: Provide [10%] extra.
6. Carbon Monoxide Detectors: Provide 10% extra.

E. Notification Appliances:
1. Speakers: 520hz.
a. Provide 10% extra.
2. Strobes: 177cd.
a. Provide 10% extra.
3. Sounder Bases:
a. Provide 10% extra.

F. Circuit Conductors: Copper or optical fiber; provide 200 feet extra; color code and label.

G. Surge Protection: In accordance with IEEE C62.41.2 category B combination waveform and NFPA 70; except for optical fiber conductors.

H. Locks and Keys: Deliver keys to Owner.

I. Instruction Charts: Printed instruction chart for operators, showing steps to be taken when a signal is received (normal, alarm, supervisory, and trouble); easily readable from normal operator's station.
1. Frame: Stainless steel or aluminum with polycarbonate or glass cover.
2. Provide one for each control unit where operations are to be performed.
3. Obtain approval of Owner prior to mounting; mount in location acceptable to Owner.
4. Provide extra copy with operation and maintenance data submittal.

PART 3 EXECUTION

3.01 Installation

A. Providein accordance with applicable codes, NFPA 72, NFPA 70, and the contract documents.

B. Provide final connections and interface units for associated devices. Conceal all wiring, conduit, boxes, and supports where installed in finished areas.

C. Raceways and Supports:
1. Coordinate locations of outlet boxes as required for installation. Only install boxes and equipment at locations based on application standards indicated in NFPA 72.
2. Secure and support raceways at intervals complying with NFPA 70. Provide supports where vertical rise exceeds permissible limits.
3. Install firestopping to preserve fire resistance rating of partitions and other elements.

D. Wiring and Connections:
1. Maintain separation of Class 1, Class 2, Class 3 remote-control, signaling, fire alarm circuits, and power-limited circuits in accordance with cable insulation class and NFPA 70.
2. Maintain circuit pathway and class designations in accordance with NFPA 72 for configuration, separation, and survivability.
3. Comply with permitted and not permitted installations for wires, cables, cable routing assemblies, communications circuits, and fire alarm circuits in accordance with NFPA 70.
4. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by AHJ. Provide independent support from building structure and suspended ceiling systems. Do not provide support from raceways, piping, ductwork, or other systems.
5. Provide grounding and bonding in accordance with Section 26 0526.
6. Comply with manufacturer's minimum cable sizes or ratings.
7. Do not exceed manufacturer's recommended maximum power, signal, or network cable lengths between components.
8. Provide network wiring in accordance with NFPA 70.
9. Neatly train and bundle conductors inside boxes, wireways, and cabinets.
10. See manufacturer's instructions for batteries.

E. Fire Alarm System Components:
1. Install field-installed devices, components, relays, notification appliances, accessories, and when applicable EoL resistors.
a. Install wiring to supervisory devices and associated EoL resistors as required for supervision of hardwired connections
2. Install Wall-Mounted Equipment: Assemble component hardware within (e.g., card bays, sub-bays, expansion bays, signal cards, other card frames, networking, signal transmission, application modules, tamper monitoring devices, interconnecting modules, and auxiliary power supplies), including space for required spare capacity, and configure settings.
3. Install Interconnect Wiring: Connect system cabinets, install processor and cards, cabling, connectors, terminations, and bonding.

F. Branch Power:
1. After installation confirmations, follow manufacturer instructions to connect branch circuit power cables to premises fire alarm system components; comply with NFPA 70.
2. Where accessories require auxiliary power, provide control power source and monitoring as indicated or as required to complete installation.

3. Install auxiliary power supplies, including indicated monitoring, and connections necessary for remote equipment.

G. System Identification:
1. Identify devices, notification appliances, components, cables, and equipment in accordance with approved submittals. See Section 26 0553.
2. Confirm fire alarm system programming meets requirements of SOO and sub-system SOOs.
3. Mark location of disconnecting means for NPFLA circuits.
4. Coordinate to provide red branch power circuit protective devices or identify them accordingly as required by NFPA 72 and NFPA 70.
5. Mark date of batteries installed on inside cover of panels and formal maintenance logs.

H. Troubleshooting and Installer Checks:
1. Field test connectivity periodically during installation process to avoid unexpected troubleshooting.
2. Check system operation for notification, FACU functions, circuit supervision, alarm initiating devices, supervisory initiating devices, dress panels/doors/covers, and programming before performing field tests.

I. Fire Alarm System Tests:
1. Perform required tests of NFPA 72. Record measured values during operational checks.
2. Confirm functional testing of fire alarm system is as indicated in Contract Documents.

3.02 Inspection and Testing for Completion

A. Notify Owner 7 days prior to beginning completion inspections and tests.
B. Notify AHJ and comply with their requirements for scheduling inspections and tests and for observation by their personnel.
C. Provide services of installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction, and adjustments.
D. Prepare for testing by ensuring that all work is complete and correct; perform preliminary tests.
E. Provide tools, software, and supplies required to accomplish inspection, testing, and document results.
F. Perform inspection and testing in accordance with NFPA 72 and requirements of AHJ; document each inspection and test.
G. Correct defective work, adjust for operation, and retest until entire system complies with Contract Documents.
H. Diagnostic Period: After successful completion of inspections and tests, operate system in normal mode for at least 14 days without system or equipment malfunctions.
1. Record system operations and malfunctions.
2. If malfunction occurs, start diagnostic period over after correction of malfunction.
3. At end of successful diagnostic period, fill out and submit NFPA 72 "Inspection and Testing Form."

3.03 Owner Personnel Instruction

A. Provide the following instruction to designated Owner personnel:
1. Hands-On Instruction: On-site, using operational system.
B. Administrative: One-hour session(s) covering issues necessary for nontechnical administrative staff; classroom:
1. Initial Training: One session precloseout.
C. Basic Operation: One-hour sessions for attendant personnel, security officers, and engineering staff; combination of classroom and hands-on:
1. Initial Training: One session precloseout.
D. Use operation and maintenance documentation as primary instruction material; have paper copies available for attendees and supplement training material aids.
E. Video record all training sessions and provide copy to owner with owner closeout submittals.

3.04 Closeout Activities

A. See Section 01 7800 - Closeout Submittals for additional submittals.
B. See Section 01 7900 - Demonstration and Training for additional requirements.
C. Closeout Demonstration: Demonstrate operation of all functions to Owner.
1. Be prepared to conduct any of required tests.
2. Have minimum one copy of operation and maintenance data, preliminary copy of project record drawings, input/output matrix, and operator instruction chart(s) available during demonstration.
3. Have authorized technical representative of FACU manufacturer present during demonstration.
4. Demonstration may be combined with inspection and testing required by AHJ; notify AHJ with enough time to schedule demonstration.
5. Repeat demonstration until successful.
D. Substantial Completion of project cannot be achieved until inspection and testing is successful and the following:
1. Specified diagnostic period without malfunction has been completed.
2. Approved operating and maintenance data has been delivered.
3. Spare parts, extra materials, and tools have been delivered.
4. All aspects of operation have been demonstrated to Owner.
5. Final acceptance of fire alarm system has been given by AHJ.
6. Occupancy permit has been granted.
7. Specified precloseout instruction is complete.

3.05 Maintenance

A. Refer to Division 01 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
B. Provide to Owner, at no extra cost, written maintenance contract for entire manufacturer's warranty period, to include work described below.

C. Perform routine inspection, testing, and preventive maintenance required by NFPA 72, including:
   1. Maintenance of fire safety interface and supervisory devices connected to fire alarm system.
   2. Repairs required, unless due to improper use, accidents, or negligence beyond control of maintenance contractor.
   3. Record keeping required by NFPA 72 and AHJ.
D. Provide trouble call-back service upon notification by Owner:
   1. Provide on-site response within two hours of notification.
   2. Include allowance for call-back service during normal working hours at no extra cost to Owner.
   3. Owner will pay for call-back service outside of normal working hours on hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.
E. Provide complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with detailed schedule.
F. Maintain on-site log listing date and time of each inspection and call-back visit, condition of system, nature of trouble, correction performed, and parts replaced. Submit duplicate of each log entry to Owner's representative upon completion of site visit.
G. Comply with Owner's requirements for access to facility and security.

END OF SECTION

SECTION 32 0116.74 - IN PLACE HOT REUSED ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Heating, scarifying, remixing, placing, and compacting existing asphaltic concrete.

1.02 REFERENCE STANDARDS

A. AI MS-19 - A Basic Asphalt Emulsion Manual; Fourth Edition.

1.03 QUALITY ASSURANCE

A. Perform Work in accordance with AI MS-20.

1.04 FIELD CONDITIONS

A. Do not perform work when weather conditions will not permit successful completion of the Work.

B. If ambient air temperature is below 50 degrees F, obtain approval prior to proceeding with the work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Recycled Material: Existing in-place asphaltic concrete.

B. Virgin Mix Materials: Provide in accordance with State of Ohio Department of Highway Standards.

C. Seal Coat: Jennite NJ-S2 "pitch" coal tar emulsion complying with ASTM D5727. type.

D. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with FS TT-P-115, Type II or AASHTO M 248, Type F.

1. Select from colors below; distinguish locations if more than one color is required.
2. Color: White.

E. Wheel Stops: Precast, air-entrained concrete, 2500-psi (17.2-MPa) minimum compressive strength, 4-1/2 inches (115 mm) high by 9 inches (225 mm) wide by 72 inches (1800 mm) long. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.

1. Dowels: Galvanized steel, 3/4-inch (19-mm) diameter, 10-inch (254-mm) minimum length.

F. Asphalt Geotextile Overlay:

1. US Fabrics, Inc., US 90P nonwoven needlepunched geotextile made of 100% polypropylene staple filaments.

2.02 EQUIPMENT

A. Recycling Equipment: Type for the intended purpose as follows:

1. Capable of processing ___ sq yd of surface per day.

B. Heated Asphalt Remixer: Type for the intended purpose as follows:

1. Self-propelled, with a wheel base sufficient to maximize leveling action.
2. Operational heater width of 10 feet minimum to 12 feet maximum; protective insulated hood over heated areas; heated, adjustable, direct flame heating not permitted.
3. Capable of processing 5,500 sq yd of surface per day.

C. Milling Unit: Type for the intended purpose as follows:

1. Self-propelled, with a wheel base sufficient to maximize leveling action.
2. Capable of loosening pavement material to a 2 inch depth.

D. Onboard Pug Mill: Type for the intended purpose as follows:

1. Horizontal shaft, hydrostatically driven, heated mixer.
2. Capable of adding and remixing recycled material, rejuvenating agent, and virgin mat.
3. To produce uniform mixture at required temperature.

E. Compactor: Pneumatic tired roller for initial compaction; steel wheeled rollers required for additional compaction and smoothness. An oscillating screed or tamper is not acceptable.

2.03 RECYCLED MIX

A. Remove random samples of existing pavement material; record sample location and perform testing.

B. Establish mix design from test sample materials.

C. Identify asphalt content, aggregate gradation curve, penetration value, viscosity of residual asphalt, and density.

D. Establish recycling agent demand ratios; determine maximum stability curve to support demand ratios.

E. Maintain minimum moisture content of 3 percent.

PART 3 EXECUTION

3.01 PREPARATION

A. Mechanically sweep pavement surfaces immediately prior to commencement of work. Clean pavement surfaces of loose foreign matter. Verify that surfaces are dry.

B. Protect existing improvements, overhanging trees, and plant life from heat damage by individual shielding and water spray.

C. Remove and store manhole covers and frames.

3.02 REMOVAL

A. Do not disfigure adjacent Work.

B. Heat pavement surface uniformly by continuous movement of a heated scarifier.

C. Execute removal to a depth not less than 1/2 inch at any point across the full width of surface without detrimental aggregate degradation, with the goal of removing the entire existing wearing course.

3.03 MIXING

A. Mix removed material by spinning or tumbling action for asphalt rejuvenation.

B. Blend recycled material, recycling agent, and virgin material in pug mill in accordance with Asphalt Recycling and Reclaiming Association' ARRA ARS-5-HR, Proven Guidelines for Hot-Mix Recycling.

C. Maintain temperature of remixed material, directly behind the screed, as follows:

1. Air Temperature: 50 Degrees F; Mix Temperature: 250 Degrees F
2. Air Temperature: 60 Degrees F; Mix Temperature: 240 Degrees F

3. Air Temperature: 70 Degrees F; Mix Temperature: 230 Degrees F

3.04 PLACING

A. Form a gutter cut 3/4 inch deep tapered to a feather edge for a minimum of 3 feet from lip of gutter; for subsequent surface overlay to be flush with the lip of the gutter.
B. Discharge remixed material and added virgin material by a heated vibratory precompactor.
C. Spread material in a windrow for profiling and precompaction.
D. Compact by a heated vibratory screed to a uniform cross sectional thickness.
E. Place mixed material to 2 inch thick. Thickness not less than 3/4" inch.

3.05 ROLLING AND COMPACTING

A. Roll and compact pavement materials to elevations existing before commencing the Work.
B. Complete the compaction process within 5 minutes of removal.
C. Compact pavement by rolling. Do not displace or extrude pavement from position.
D. Develop rolling with consecutive passes to achieve even and smooth finish, without roller marks.
E. Reinstall manhole covers and frames.

3.06 SEAL COAT

A. Apply seal coat to top surface of wearing course in accordance with Asphalt Institute MS-19.

3.07 PROTECTION

A. Do not permit traffic over surface for 2 hours.

END OF SECTION

SECTION 32 1216 - ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aggregate base course.
B. Single course bituminous concrete paving.
C. Double course bituminous concrete paving.
D. Surface sealer.

1.02 REFERENCE STANDARDS

A. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types; 1997.
B. AI MS-19 - A Basic Asphalt Emulsion Manual; Fourth Edition.
C. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction; 2009a.

1.03 QUALITY ASSURANCE

A. Perform Work in accordance with State of Ohio Highways standard.
B. Obtain materials from same source throughout.

1.04 FIELD CONDITIONS

A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.
B. Place bitumen mixture when temperature is not more than 15 F degrees below bitumen supplier's bill of lading and not more than maximum specified temperature.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Cement: ASTM D946.
B. Aggregate for Base Course: in accordance with State of Ohio Highways standard.
C. Aggregate for Binder Course: in accordance with State of Ohio Highways standard.
D. Aggregate for Wearing Course: in accordance with State of Ohio Highways standard.
E. Fine Aggregate: in accordance with State of Ohio Highways standard. .
F. Tack Coat: In accordance with State of Ohio Highways standards.
G. Seal Coat: Jennite NJ-S2 "pitch" coal tar emulsion complying with ASTM D5727. type.
H. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with FS TT-P-115, Type II or AASHTO M 248, Type F.
   1. Select from colors below; distinguish locations if more than one color is required.
   2. Color: White.
I. Wheel Stops: 100% recycled plastic wheel stops 5.5 inches wide by 72 inches (1800 mm) long. Provide chamfered corners and holes for anchoring to substrate.
   1. Dowels: Galvanized steel, 5/8-inch diameter, 12-inch minimum length.
J. Base stabilization geogrid: US 250 as manufactured by US Fabrics, Inc., woven geotextile made of 100% polypropylene slit film yarns.

2.02 ASPHALT PAVING MIXES AND MIX DESIGN

A. Asphalt Base Course: 3.0 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.
B. Asphalt Binder Course: 4.5 to 6 percent of asphalt cement by weight in mixture in accordance with AI ____.
C. Asphalt Wearing Course: 5 to 7 percent of asphalt cement by weight in mixture in accordance with AI MS-2.

2.03 SOURCE QUALITY CONTROL

A. Test mix design and samples in accordance with AI MS-2.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.
B. Verify gradients and elevations of base are correct.

3.02 AGGREGATE BASE COURSE

A. Place and compact aggregate base course.

3.03 PREPARATION - PRIMER

A. Apply primer in accordance with manufacturer's instructions.
B. Apply primer on aggregate base or subbase at uniform rate of 1/3 gal/sq yd.
C. Use clean sand to blot excess primer.

3.04 PREPARATION - TACK COAT

A. Apply tack coat in accordance with manufacturer's instructions.
B. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 1/3 gal/sq yd.
C. Apply tack coat to contact surfaces of curbs, gutters and _____.
D. Coat surfaces of manhole frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.05 PLACING ASPHALT PAVEMENT - SINGLE COURSE

A. Install Work in accordance with State of Ohio Highways standardsx
B. Place asphalt within 24 hours of applying primer or tack coat.
C. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
D. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.06 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

A. Place asphalt binder course within 24 hours of applying primer or tack coat.
B. Place asphalt wearing course within two hours of placing and compacting binder course.

C. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
D. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.07 SEAL COAT

A. Apply seal coat to asphalt surface course and asphalt curbs in accordance with AI MS-19.

3.08 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
B. Compacted Thickness: Within 1/4 inch of specified or indicated thickness.
C. Variation from True Elevation: Within 1/2 inch.

3.09 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury for ____ days or until surface temperature is less than 140 degrees F.

END OF SECTION

SECTION 32 1313 - CONCRETE PAVING

PART 1 GENERAL

1.01 Section Includes

A. Concrete sidewalks, stair steps, integral curbs, gutters, median barriers, parking areas, and roads.

1.02 Related Requirements

A. Section 03 1000 - Concrete Forming and Accessories.
B. Section 03 2000 - Concrete Reinforcing.
C. Section 03 3000 - Cast-in-Place Concrete.
D. Section 32 1726 - Tactile Warning Surfacing: Plastic tactile and detectable warning tiles for pedestrian walking surfaces.

1.03 Reference Standards

A. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
A. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.
A. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.
A. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.
A. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2024.
C. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2023.
D. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2024.
E. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2021b.
F. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2014.
G. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).
H. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.
I. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.
J. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
K. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2004a (Reapproved 2013).

1.04 Submittals

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on joint filler, admixtures, and curing compound.

PART 2 PRODUCTS

2.01 Paving Assemblies

A. Comply with applicable requirements of ACI SPEC-301.

2.02 Form Materials

A. Form Materials: As specified in Section 03 1000, comply with ACI SPEC-301.
B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
   1. Thickness: 1/2 inch.
   1. Product:

2.03 Reinforcement

A. Reinforcing Steel and Welded Wire Reinforcement: Types specified in Section 03 2000.
B. Dowels: ASTM A615/A615M, Grade 40 - 40,000 psi yield strength; deformed billet steel bars; unfinished finish.

2.04 Concrete Materials

A. Obtain cementitious materials from same source throughout.
B. Concrete Materials: As specified in Section 03 3000.
C. Fiber Reinforcement: Synthetic fibers shown to have long-term resistance to deterioration when in contact with alkalis and moisture; 1/2 inch length.

2.05 Accessories

A. Curing Compound: ASTM C309, Type 1, Class A.
B. Tactile Warning Surfaces: See Section 32 1726.
C. Joint Sealer: Type ____ as specified in Section 07 9005.

2.06 Concrete Mix Design

A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.
B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301.
   1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
C. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.
D. Concrete Properties:
   1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; _____ psi.
   2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
   4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
   5. Water-Cement Ratio: Maximum .48 percent by weight.

6. Total Air Content: 4 percent, determined in accordance with ASTM C173/C173M.
7. Maximum Slump: 3 inches.

2.07 Mixing

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
B. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 Examination

A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
B. Verify gradients and elevations of base are correct.

3.02 Subbase

A. Prepare subbase in accordance with State of Ohio Highways standards .

3.03 Preparation

A. Moisten base to minimize absorption of water from fresh concrete.
B. Coat surfaces of manhole frames with oil to prevent bond with concrete pavement.
C. Notify Architect minimum 48 hours prior to commencement of concreting operations.

3.04 Forming

A. Place and secure forms to correct location, dimension, profile, and gradient.
B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.05 Reinforcement

A. Place reinforcement as indicated.
B. Interrupt reinforcement at contraction joints.
C. Place dowels to achieve pavement and curb alignment as detailed.

3.06 Cold and Hot Weather Concreting

A. Follow recommendations of ACI PRC-305 when concreting during hot weather.
B. Follow recommendations of ACI PRC-306 when concreting during cold weather.
C. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

3.07 Placing Concrete

A. Place concrete in accordance with ACI PRC-304.
B. Ensure reinforcement, inserts, embedded parts, formed joints and ____ are not disturbed during concrete placement.
C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.08 Joints

A. Place 3/8 inch wide expansion joints at 20 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.
   1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
B. Provide scored joints.
   1. At sidewalks and curbs: spaced to match width of sidewalk.
   2. At driveways: at 10' intervals.
C. Saw cut contraction joints 3/16 inch wide at an optimum time after finishing. Cut 1/3 into depth of slab.

3.09 Finishing

A. Area Paving: Light broom, texture perpendicular to pavement direction with troweled and radiused edges; 1/4" radius.
B. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with tooled picture frame troweled and radiused edges and joints; 1/4 inch radius.
C. Curbs and Gutters: Light broom, texture parallel to pavement direction.
D. Inclined Vehicular Ramps: Broomed perpendicular to slope.
E. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.10 JOINT SEALING

A. See Section 07 9005 for joint sealer requirements.

3.11 Tolerances

A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
B. Maximum Variation From True Position: 1/4 inch.

3.12 Field Quality Control

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
   1. Provide free access to concrete operations at project site and cooperate with appointed firm.
   2. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
B. Compressive Strength Tests: ASTM C39/C39M; for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.
   1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
   2. Perform one slump test for each set of test cylinders taken.
C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.13 Protection

A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

B. Do not permit pedestrian traffic over pavement for 7 days minimum after finishing.

END OF SECTION

SECTION 32 1723 - PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Painted pavement markings.

1.02 REFERENCE STANDARDS

A. AASHTO MP 24 - Standard Specification for Waterborne White and Yellow Traffic Paints; 2015 (Reapproved 2020).

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work of this section with adjoining work.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used.
C. Manufacturer's Instructions:
  1. Preparation instructions and recommendations.
  2. Storage and handling requirements and recommendations.
  3. Installation methods.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience and approved by manufacturer.

PART 2 PRODUCTS

2.01 Painted Pavement Markings

A. Painted Pavement Markings: As indicated on drawings.
  1. Marking Paint: In accordance with AASHTO MP 24.
    a. Parking Lots: Yellow.
    b. Symbols and Text: White.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify existing markings for removal.
B. Verification of Conditions: Verify that pavement is dry and ready for installation.
C. Notify Architect of unsatisfactory conditions before proceeding.

3.02 PREPARATION

A. Clean surfaces prior to installation.
  1. Remove dust, dirt, and other debris.
  2. Remove rubber deposits, existing paint markings, and other coatings.
B. Apply paint stencils by type and color at necessary intervals.

3.03 INSTALLATION

A. General:
  1. Position pavement markings as indicated on drawings.
  2. Field location adjustments require approval of Architect.
B. Painted Pavement Markings:
  1. Apply in accordance with manufacturer's instructions.
  2. Marking Paint: Apply uniformly, with sharp edges.
    a. Applications: One coat.
    b. Wet Film Thickness: 0.015 inch, minimum.
    c. Stencils: Lay flat against pavement, align with striping, remove after application.

3.04 TOLERANCES

A. Maximum Variation From True Position: 3 inches (76 mm).
B. Maximum Offset From True Alignment: 3 inches (76 mm).

3.05 PROTECTION

A. Replace damaged or removed markings at no additional cost to Owner.

END OF SECTION

SECTION 32 3300 - SITE FURNISHINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bollards.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Bollard infill and underground encasement.

B. Section 05 5000 - Metal Fabrications: Utilitarian concrete filled steel pipe bollards.

1.03 REFERENCE STANDARDS

A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's specifications and descriptive literature, installation instructions, and maintenance information.

C. Shop Drawings: Indicate plans for each unit or group of units, elevations with model number, overall dimensions, construction, and anchorage details.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Pipe Bollards:

1. Huntco Supply, LLC; 6" Bollards: www.huntco.com.
2. Reliance Foundry Co. Ltd; Bollard R-7901: www.reliance-foundry.com.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BOLLARDS

A. Steel Pipe Bollards: Hollow steel pipe with plain shaft.

1. Shape: Round.
2. Diameter: 6 inches.
3. Cap: Formed steel dome.
4. Materials:
   a. Steel Pipe: ASTM A53/A53M, standard weight.
   b. Factory Finish: Primed.
   c. Color: As selected by Architect from manufacturer's standard range.
5. Mounting: In-ground.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify proper installation of mounting surfaces, preinstalled anchor bolts, and other mounting devices; and ready to receive site furnishing items.

B. Do not begin installation until unacceptable conditions are corrected.

3.02 INSTALLATION

A. Install steel bollards in accordance with approved shop drawings, and manufacturer's installation instructions.

END OF SECTION

PART 2 PRODUCTS

1.01 SEED MIXTURE

A. Seed Mixture:

1. Merion Blue Grass: ____ percent.

END OF SECTION

SECTION 32 9223 - SODDING

PART 2 PRODUCTS

1.01 MATERIALS

A. Sod: TPI (SPEC), Certified Turfgrass Sod quality; cultivated grass sod; type indicated in plant schedule on Drawings; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq ft. Minimum age of 18 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.

END OF SECTION

SECTION 32 9300 - PLANTS

PART 1 GENERAL

1.01 Section Includes
- A. Placing topsoil.
- B. New trees, plants, and ground cover.
- C. Relocated trees, plants, and ground cover.
- D. Grass and groundcover
- E. Sod
- F. Mulch and Fertilizer.
- G. Maintenance.

1.02 Related Requirements

1.03 Reference Standards
- A. ANSI/AHIA Z60.2 - American Standard for Nursery Stock; 2025.
- B. TPI (SPEC) - Guideline Specifications to Turfgrass Sodding; 2006.

1.04 Submittals
- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Submit list of plant life sources.

1.05 QUALITY ASSURANCE
- A. Nursery Qualifications: Company specializing in growing and cultivating the plants with three years documented experience.
- B. Installer Qualifications: Company specializing in installing and planting the plants with 5 years experience.
- C. Maintenance Services: Performed by installer up until Substantial Completion.

1.06 DELIVERY, STORAGE, AND HANDLING
- A. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
- B. Protect and maintain plant life until planted.
- C. Deliver plant life materials immediately prior to placement. Keep plants moist.

1.07 FIELD CONDITIONS
- A. Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.
- B. Do not install plant life when wind velocity exceeds 30 mph.

1.08 Warranty
- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide one year warranty on all plantings and shrubbery commencing at time of acceptanceof lawns and plantings by the Architect.
  1. Replace dead and unhealthy plants within the warranty period.
  2. Warranty shall stipulate the Landscape contractor is responsible for maintaining all lawns and plantings for a period of 12 months or until they are established, whichever period is longer and final acceptance in writing from the Architect is delivered to the landscape contractor.
     - a. This maintenance is to include mowing, fertilizing, treating adn watering. labor, equipment and materials are by the contractor (except for water provided by the Owner).
- C. Warranty: Include coverage for one continuous growing season; commencing at date of Substantial Completion; replace dead or unhealthy plants.

PART 2 PRODUCTS

2.01 Plants
- A. Plants: Species and size identified in plant schedule, grown in climatic conditions similar to those in locality of the work according to ANSI/AHIA Z60.2.

2.02 GRASS MATERIALS
- A. Grass Seed: Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide minimum of three varieties comparable to or better than the varieties specified below in paragraph a.
  1. Turf Type Tall Fescue Varieties: Titan Rx, Sidewinder, Quest, Inferno, Firenza, Cochise V, Talladega, Tahoe, Titanium, Hounddog 6, Dixie Green and Rendition.
  2. Rygrass Varieties: Grandslam, Stellar, Phenom, Nobility, Nexus XD, Accent II, Caddieshack, Goal Keeper, Charismatic II, Slugger, Amazing and Gator.
     - a. Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:
       1) 30% Firenza Turf Type Tall Fescue
       2) 30% Cochise V Turf Type Tall Fescue
       3) 30% Talledega Turf Type Tall Fescue
       4) 10% GrandSlam Perennial Ryegrass

2.03 GROUND COVER
- A. Provide plants established and well rooted in removable containers or integral peat pots and with not less than minimum number and length of runners required by ANSI Z60.1 for the pot size shown or listed.

2.04 WEED-CONTROL BARRIERS
- A. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd. (162 g/sq. m).
- B. Install at all mulched beds.

2.05 Soil Materials

A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; minimum pH value of 5.4 and maximum 7.0.

2.06 Soil Amendment Materials

A. Commercial Fertilizer: Complete fertilizer of neutral character, with some elements derived from organic sources and containing following percentages of available plant nutrients:

1. For trees and shrubs, provide fertilizer with not less than 5 percent total nitrogen, 10 percent available phosphoric acid and 5 percent soluble potash.
2. For lawns, provide fertilizer with percentage of nitrogen required to provide not less than 1 pound of actual nitrogen per 1,000 sq. ft. of lawn area and not less than 4 percent phosphoric acid and 2 percent potassium. Provide nitrogen in a form that will be available to lawn during initial period of growth; at least 50 percent of nitrogen to be organic form.

B. Peat Moss: Shredded, loose, sphagnum moss; free of lumps, roots, inorganic material or acidic materials; minimum of 85 percent organic material measured by oven dry weight, pH range of 4 to 5; moisture content of 30 percent.

C. Bone Meal: Raw, finely ground, commercial grade, minimum of 3 percent nitrogen and 20 percent phosphorous.

D. Lime: Ground limestone, dolomite type, minimum 95 percent carbonates.

2.07 Mulch

A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.

B. In lieu of wood mulch provide 3/4" river wash stone over weed mat.

2.08 SOD

A. Sod: TPI (SPEC), Certified Turfgrass Sod quality; cultivated grass sod; type indigenous and available to project location; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq ft. Minimum age of 18 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.

2.09 ACCESSORIES

A. Wrapping Materials: Burlap.

B. Stakes: Softwood lumber, pointed end.

C. Cable, Wire, Eye Bolts and Turnbuckles: Non-corrosive, of sufficient strength to withstand wind pressure and resulting movement of plant life.

D. Plant Protectors: Rubber sleeves over cable to protect plant stems, trunks, and branches.

2.10 TOP SOIL MIX

A. A uniform mixture of 1 part peat and 3 parts topsoil by volume.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared subsoil and planters are ready to receive work.

B. Saturate soil with water to test drainage.

C. Verify that required underground utilities are available, in proper location, and ready for use.

3.02 PLACING TOPSOIL

A. Spread topsoil to a minimum depth of 4 inches over area to be planted. Rake smooth.

B. Place topsoil during dry weather and on dry unfrozen subgrade.

C. Remove vegetable matter and foreign non-organic material from topsoil while spreading.

D. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.

E. Install topsoil into pits and beds intended for plant root balls, to a minimum thickness of 6 inches.

3.03 FERTILIZING

A. Apply fertilizer in accordance with manufacturer's instructions.

B. Apply after initial raking of topsoil.

C. Mix thoroughly into upper 2 inches of topsoil.

D. Lightly water to aid the dissipation of fertilizer.

3.04 PLANTING

A. Set plants vertical.

B. Remove non-biodegradable root containers.

C. Set plants in pits or beds, partly filled with prepared plant mix, at a minimum depth of 6 inches under each plant. Remove burlap, ropes, and wires, from the root ball.

D. Place bare root plant materials so roots lie in a natural position. Backfill soil mixture in 6 inch layers. Maintain plant life in vertical position.

E. Saturate soil with water when the pit or bed is half full of topsoil and again when full.

3.05 SEEDING NEW LAWNS

A. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.

B. Sow seed using a spreader or seeding machine. Do not seed when wind velocity exceeds 5 miles per hour. Distribute

C. Sow seed at rate of 4 pounds per 1,000 square feet.

D. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with a fine spray.

E. Protect seeded slopes against erosion with erosion netting or other methods acceptable to the Architect.

F. Protect seeded areas against erosion by spreading specified lawn mulch after completion of seeding operations. Spread uniformly to form a continuous blanket not less than 1-1/2 inches loose measurement over seeded areas.

1. Anchor mulch by spraying with asphalt emulsion at the rate of 10 to 13 gallons per 1000 sq. ft. Take precautions to prevent damage or staining of construction or other plantings adjacent to mulched areas.

3.06 HYDROSEEDING NEW LAWNS

A. Hydro-seeding of new lawns is acceptable.
B. Mix specified seed, fertilizer, and pulverized mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
C. Apply slurry uniformly to all areas to be seeded. Rate of application as required to obtain specified seed sowing rate.

3.07 PLANTING GROUND COVER

A. Space ground cover plants as indicated or scheduled.
B. Dig holes large enough to allow for spreading of roots and backfill with planting soil. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water. Water thoroughly after planting, taking care not to cover crowns of plants with wet soils.
C. Mulch areas between ground cover plants; place not less than 2 inches thick.

3.08 INSTALLATION OF ACCESSORIES

3.09 Maintenance

A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

END OF SECTION