

# **PROJECT MANUAL**

## **VETERAN'S VILLAGE**

**1239 STATE ROUTE 125  
MONROE TOWNSHIP, OHIO 45102**



Dated:  
FEBRUARY 20, 2026

Owner

Clermont Housing Corporation  
65 South Market Street  
Batavia, Ohio 45103

Approved for Construction by:

Architect: Creative Housing Solutions, Inc.

\_\_\_\_\_  
Donald L. Dudrow, Jr., AIA, RA, CEM

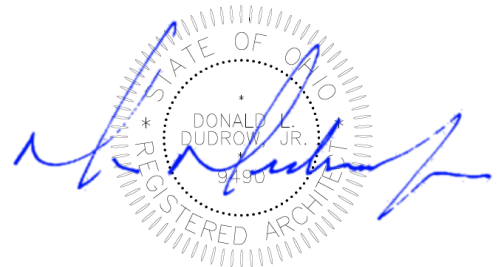
Owner: Clermont Housing Corporation

\_\_\_\_\_  
Ms. Alicia Morlatt, Executive Director



935 Lenox Place  
Cincinnati, OH 45229  
P. (513) 961-4400 (800) 321-5270  
[info@chs-incorp.com](mailto:info@chs-incorp.com)

Project Architect: Brian T. Yacucci, NCARB, RA  
Architect of Record: Donald L. Dudrow, Jr. AIA, NCARB, CEM  
Job #2413-A



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# DRAFT AIA® Document A701™ – 2018

## Instructions to Bidders

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

2025 Marsh Run Apartments Renovation

**THE OWNER:**  
(Name, legal status, address, and other information)

Clermont Housing Corporation  
65 South Market Street  
Batavia, Ohio 45103  
(513) 732-6010

**THE ARCHITECT:**  
(Name, legal status, address, and other information)

Creative Housing Solutions, Inc.  
935 Lenox Place, Cincinnati, OH 45229  
Phone (513) 961-4400  
www.chs-incorp.com  
email: info@chs-incorp.com

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**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.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™-2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

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## ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

## ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

## ARTICLE 3 BIDDING DOCUMENTS

### § 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)*

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§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper

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**User Notes:**

(1249064778)

documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

### § 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.  
*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)*

« »

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

### § 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

#### § 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

### § 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)*

« »

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

## ARTICLE 4 BIDDING PROCEDURES

### § 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

### § 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

*(Insert the form and amount of bid security.)*

« »

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

**§ 4.2.3** If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

**§ 4.2.4** The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning « » days after the opening of Bids, withdraw its Bid and request the return of its bid security.

#### **§ 4.3 Submission of Bids**

**§ 4.3.1** A Bidder shall submit its Bid as indicated below:

*(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)*

« »

**§ 4.3.2** Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

**§ 4.3.3** Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

**§ 4.3.4** The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

**§ 4.3.5** A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

#### **§ 4.4 Modification or Withdrawal of Bid**

**§ 4.4.1** Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

**§ 4.4.2** Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

**§ 4.4.3** After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:

*(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)*

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### **ARTICLE 5 CONSIDERATION OF BIDS**

#### **§ 5.1 Opening of Bids**

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

## **§ 5.2 Rejection of Bids**

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

## **§ 5.3 Acceptance of Bid (Award)**

**§ 5.3.1** It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

**§ 5.3.2** Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

## **ARTICLE 6 POST-BID INFORMATION**

### **§ 6.1 Contractor's Qualification Statement**

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

### **§ 6.2 Owner's Financial Capability**

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

### **§ 6.3 Submittals**

**§ 6.3.1** After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

1. a designation of the Work to be performed with the Bidder's own forces;
2. names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
3. names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

**§ 6.3.2** The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

**§ 6.3.3** Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

**§ 6.3.4** Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

## **ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND**

### **§ 7.1 Bond Requirements**

**§ 7.1.1** If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

*(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)*

« »

## § 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

## ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.  
*(Insert the complete AIA Document number, including year, and Document title.)*

« »

- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.  
*(Insert the complete AIA Document number, including year, and Document title.)*

« »

- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.  
*(Insert the complete AIA Document number, including year, and Document title.)*

« »

- .4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:  
*(Insert the date of the E203-2013.)*

« »

- .5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda:

Number	Date	Pages

.8 Other Exhibits:

*(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*

[ ☐ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:  
*(Insert the date of the E204-2017.)*

« »

[ ☐ ] The Sustainability Plan:

Title	Date	Pages

[ ☐ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents listed below:

*(List here any additional documents that are intended to form part of the Proposed Contract Documents.)*

« »

## DOCUMENT 002213 - SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

### 1.1 INSTRUCTIONS TO BIDDERS

A. Instructions to Bidders for Project consist of the following:

1. AIA Document A701, "Instructions to Bidders", a copy of which is bound in this Project Manual.
2. The following Supplementary Instructions to Bidders that modify and add to the requirements of the Instructions to Bidders.

### 1.2 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS, GENERAL

- A. The following supplements modify AIA Document A701, "Instructions to Bidders." Where a portion of the Instructions to Bidders is modified or deleted by these Supplementary Instructions to Bidders, unaltered portions of the Instructions to Bidders shall remain in effect.

### 1.3 ARTICLE 2 - BIDDER'S REPRESENTATIONS

A. Add Section 2.1.3.1:

1. 2.1.3.1 - The Bidder has investigated all required fees, permits, and regulatory requirements of authorities having jurisdiction and has properly included in the submitted bid the cost of such fees, permits, and requirements not otherwise indicated as provided by Owner.

B. Add Section 2.1.5:

1. 2.1.5 - The Bidder is a properly licensed Contractor according to the laws and regulations of State of Ohio and Clermont County and meets qualifications indicated in the Procurement and Contracting Documents.

C. Add Section 2.1.6:

1. 2.1.6 - The Bidder has incorporated into the Bid adequate sums for work performed by installers whose qualifications meet those indicated in the Procurement and Contracting Documents.

### 1.4 ARTICLE 3 - BIDDING DOCUMENTS

A. 3.2 - Interpretation or Correction of Procurement and Contracting Documents:

1. Add Section 3.2.2.1:

- a. 3.2.2.1 - Submit Bidder's Requests for Interpretation to [byacucci@chs-incorp.com](mailto:byacucci@chs-incorp.com)



B. 3.4 - Addenda:

1. Delete Section 3.4.3 and replace with the following:
  - a. 3.4.3 - Addenda may be issued at any time prior to the receipt of bids.
2. Add Section 3.4.4.1:
  - a. 3.4.4.1 - Owner may elect to waive the requirement for acknowledging receipt of 3.4.4 Addenda as follows:
    - 1) 3.4.4.1.1 - Information received as part of the Bid indicates that the Bid, as submitted, reflects modifications to the Procurement and Contracting Documents included in an unacknowledged Addendum.
    - 2) 3.4.4.1.2 - Modifications to the Procurement and Contracting Documents in an unacknowledged Addendum do not, in the opinion of Owner, affect the Contract Sum or Contract Time.

1.5 ARTICLE 4 - BIDDING PROCEDURES

A. 4.1 - Preparation of Bids:

1. Add Section 4.1.1.1:
  - a. 4.1.1.1 - Printable electronic Bid Forms and related documents are available from Architect.
2. Add Section 4.1.8:
  - a. 4.1.8 - The Bid shall include unit prices when called for by the Procurement and Contracting Documents. Owner may elect to consider unit prices in the determination of award. Unit prices will be incorporated into the Contract.
3. Add Section 4.1.9:
  - a. 4.1.9 - Owner may elect to disqualify a bid due to failure to submit a bid in the form requested, failure to bid requested alternates or unit prices, failure to complete entries in all blanks in the Bid Form, or inclusion by the Bidder of any alternates, conditions, limitations or provisions not called for.
4. Add Section 4.1.10:
  - a. 4.1.10 - Bids shall include sales and use taxes. Contractors shall show separately with each monthly payment application the sales and use taxes paid by them and their subcontractors in the form indicated. Reimbursement of sales and use taxes, if any, shall be applied for by Owner for the sole benefit of Owner.

B. 4.3 - Submission of Bids:

1. Add Section 4.3.1.2:

- a. 4.3.1.2 - Include Bidder's Contractor License Number applicable in Project jurisdiction on the face of the sealed bid envelope.

C. 4.4 - Modification or Withdrawal of Bids:

1. Add the following sections to 4.4.2:

- a. 4.4.2.1 - Such modifications to or withdrawal of a bid may only be made by persons authorized to act on behalf of the Bidder. Authorized persons are those so identified in the Bidder's corporate bylaws, specifically empowered by the Bidder's charter or similar legally binding document acceptable to Owner, or by a power of attorney, signed and dated, describing the scope and limitations of the power of attorney. Make such documentation available to Owner at the time of seeking modifications or withdrawal of the Bid.
- b. 4.4.2.2 - Owner will consider modifications to a bid written on the sealed bid envelope by authorized persons when such modifications comply with the following: the modification is indicated by a percent or stated amount to be added to or deducted from the Bid; the amount of the Bid itself is not made known by the modification; a signature of the authorized person, along with the time and date of the modification, accompanies the modification. Completion of an unsealed bid form, awaiting final figures from the Bidder, does not require power of attorney due to the evidenced authorization of the Bidder implied by the circumstance of the completion and delivery of the Bid.

D. 4.5 - Break-Out Pricing Bid Supplement:

1. Add Section 4.5:

- a. 4.5 - Provide detailed cost breakdowns no later than two business days following Architect's request.

E. 4.6 - Subcontractors, Suppliers, and Manufacturers List Bid Supplement:

1. Add Section 4.6:

- a. 4.6 - Provide list of major subcontractors, suppliers, and manufacturers furnishing or installing products no later than two business days following Architect's request. Include those subcontractors, suppliers, and manufacturers providing work totaling 10 percent or more of the Bid amount. Do not change subcontractors, suppliers, and manufacturers from those submitted without approval of Architect.

1.6 ARTICLE 5 - CONSIDERATION OF BIDS

A. 5.2 - Rejection of Bids:

1. Add Section 5.2.1:

- a. 5.2.1 - Owner reserves the right to reject a bid based on Owner's and Architect's evaluation of qualification information submitted following opening of bids. Owner's evaluation of the Bidder's qualifications will include: status of licensure and record of compliance with licensing requirements, record of quality of completed work, record of Project completion and ability to complete, record of financial management including financial resources available to complete Project and record of timely payment of obligations, record of Project site management including compliance with requirements of authorities having jurisdiction, record of and number of current claims and disputes and the status of their resolution, and qualifications of the Bidder's proposed Project staff and proposed subcontractors.

1.7 ARTICLE 6 - POSTBID INFORMATION

A. 6.1 - Contractor's Qualification Statement:

1. Add Section 6.1.1:

- a. 6.1.1 - Submit Contractor's Qualification Statement no later than two business days following Architect's request.

B. 6.3 - Submittals:

1. Add Section 6.3.1.4:

- a. 6.3.1.4 - Submit information requested in Sections 6.3.1.1, 6.3.1.2, and 6.3.1.3 no later than two business days following Architect's request.

1.8 ARTICLE 7 - PERFORMANCE BOND AND PAYMENT BOND

A. 7.1 - Bond Requirements:

1. Add Section 7.1.1.1:

- a. 7.1.1.1 - Both a Performance Bond and a Payment Bond will be required, each in an amount equal to 100 percent of the Contract Sum.

B. 7.2 - Time of Delivery and Form of Bonds:

1. Delete the first sentence of Section 7.2.1 and insert the following:

- a. The Bidder shall deliver the required bonds to Owner no later than 10 calendar days after the date of Notice of Intent to Award and no later than the date of execution of the Contract, whichever occurs first. Owner may deem the failure of the Bidder to deliver required bonds within the period of time allowed a default.

2. Delete Section 7.2.3 and insert the following:

- a. 7.2.3 - Bonds shall be executed and be in force on the date of the execution of the Contract.

1.9 ARTICLE 8 - FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

- A. HUD 92442-M Construction Contract, Lump Sum.

1.10 ARTICLE 9 - EXECUTION OF THE CONTRACT

- A. Add Article 9:

1. 9.1.1 - Subsequent to the Notice of Intent to Award, and within 10 calendar days after the prescribed Form of Agreement is presented to the Awardee for signature, the Awardee shall execute and deliver the Agreement to Owner through Architect, in such number of counterparts as Owner may require.
2. 9.1.2 - Owner may deem as a default the failure of the Awardee to execute the Contract and to supply the required bonds when the Agreement is presented for signature within the period of time allowed.
3. 9.1.3 - Unless otherwise indicated in the Procurement and Contracting Documents or the executed Agreement, the date of commencement of the Work shall be the date of the executed Agreement.
4. 9.1.4 - In the event of a default, Owner may declare the amount of the Bid security forfeited and elect to either award the Contract to the next responsible bidder or re-advertise for bids.

END OF DOCUMENT 002213

# DRAFT AIA® Document A201® – 2017

## General Conditions of the Contract for Construction

### for the following PROJECT:

(Name and location or address)

Veteran's Village  
2139 State Route 125  
Monroe Township, Ohio 45102

### THE OWNER:

(Name, legal status and address)

Clermont Housing Corporation  
65 South Market Street  
Batavia, Ohio 45103  
(513) 732-6010

»« »  
« »

### THE ARCHITECT:

(Name, legal status and address)

Creative Housing Solutions, Inc.  
935 Lenox Place, Cincinnati, OH 45229  
Phone (513) 961-4400  
[www.chs-incorp.com](http://www.chs-incorp.com)  
email: [info@chs-incorp.com](mailto:info@chs-incorp.com)

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#### 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.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, *Guide for Supplementary Conditions*.

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- 12 UNCOVERING AND CORRECTION OF WORK
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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. 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, (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.

**§ 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, Architect, and the Architect's consultants.

**§ 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 will 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, 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 prior 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.

**§ 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 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.

**§ 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 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.

### **§ 3.4 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 Architect in accordance with Section 3.12.8 or ordered by the 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 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 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 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.

**§ 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 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 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.

**§ 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 Architect's approval. The Architect's 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.

**§ 3.11 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.

**§ 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 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 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), but only to the extent caused by the negligent 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 or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

## 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. 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 Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the 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 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 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.

**§ 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 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 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 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 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 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 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 wrongfully 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.

**§ 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 Architect alone.

**§ 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.

**§ 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 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 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 Architect's 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 Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

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

**§ 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 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 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 Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the 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 notarized, if required, 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 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.

### § 9.4 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 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 responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 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; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

**§ 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 9.5.1.3, 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, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

**§ 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.



**§ 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**

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 certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' 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 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 Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's 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 Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

**§ 9.8.4** When the Work or designated portion thereof is substantially complete, the 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. 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, the Owner shall make payment of retainage applying to 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.



### **§ 9.9 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 Architect will promptly make such inspection. When the Architect 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.

**§ 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, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases 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. 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.

**§ 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.

#### **§ 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 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 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 described in the Agreement or elsewhere in the Contract Documents. The Contractor 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. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

### § 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.

§ 11.2.2 **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. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice 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.

### **§ 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 mortgage 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 Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the 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 Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered 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 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.



### **§ 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, 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 for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. 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 Architect timely notice of when and where tests and inspections are to be made so that the Architect 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.

## 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 not 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:

- .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 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 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 9.7 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 the scheduled construction.

**§ 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.

**§ 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 a Claim 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.

**§ 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.

**§ 15.4 Arbitration**

**§ 15.4.1** If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

**§ 15.4.1.1** A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

**§ 15.4.2** The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

**§ 15.4.3** The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

**§ 15.4.4 Consolidation or Joinder**

**§ 15.4.4.1** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

**§ 15.4.4.2** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

**§ 15.4.4.3** The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

**NON COLLUSIVE AFFIDAVIT**

State of \_\_\_\_\_

County of \_\_\_\_\_

\_\_\_\_\_, being first sworn, deposes and says:

That s/he is \_\_\_\_\_ of \_\_\_\_\_  
(sole owner, partner, etc.) (Firm Name)

the party making the foregoing proposal or bid, that such proposal or bid is genuine and not collusive or sham; that aspired, connived or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly, or indirectly, sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or of any other bidder, or to fix any overhead, profit or cost element of said bid price, to secure any advantage against the Owner or any person interested in the proposed contract; and that all statements in said proposal or bid are true.

Signature of Bidder: \_\_\_\_\_  
(If Individual)

Signature of Bidder: \_\_\_\_\_  
(If Partnership)

Signature of Bidder: \_\_\_\_\_  
(If Corporation)

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 20\_\_

\_\_\_\_\_, My commission expires \_\_\_\_\_, 20\_\_  
Notary Public

NCA

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DOCUMENT 003132 - GEOTECHNICAL DATA

1.1 GEOTECHNICAL DATA

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for contractor's convenience and are intended to supplement rather than serve in lieu of Contractor's own investigations. They are made available for contractor's convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
- B. Soil-boring data for Project, obtained by UES Professional Solutions 25, LLC, dated February 6, 2026, is available for viewing as appended to this Document.
- C. A geotechnical investigation report for Project, prepared by UES Professional Solutions 25, LLC, dated February 6, 2026, is available for viewing as appended to this Document.
- D. Related Requirements:
  - 1. Document 002113 "Instructions to Bidders" for the Bidder's responsibilities for examination of Project site and existing conditions.

1.2 PROJECT REQUIREMENTS

- A. Geotechnical review: Contractor shall engage a geotechnical engineer to review soil conditions and confirm bearing capacities prior to placement of footings, slabs, and pavement.
  - 1. Per Geotechnical Report: "Since the intent of the design recommendations is best understood by UES, we recommend that UES be included in the final design and construction process and be retained to review the project plans and specifications to confirm that the recommendations given in this report have been correctly implemented. We recommend that UES be retained to participate in pre-bid and preconstruction conferences to reduce the risk of misinterpretation of the conclusions and recommendations in this report relative to the proposed construction of the subject project."
  - 2. Following clearing and stripping the site of existing vegetation and topsoil and site demolition activities, the exposed subgrade within structure, pavement, and proposed fill areas should be thoroughly proof rolled using a heavily loaded piece of equipment (e.g., a loaded tandem-axle dump truck weighing at least 40,000 pounds) under the review of the Project Geotechnical Engineer, or a representative thereof. Although not anticipated, soft or yielding soils observed during the proof rolling should be undercut to stiff, non-yielding, cohesive soils or medium dense to dense, well-graded, cohesionless soils.

END OF DOCUMENT 003132



**GEOTECHNICAL EXPLORATION  
CLERMONT COUNTY VETERANS VILLAGE  
AMELIA, OHIO**

Prepared for:  
**CLERMONT METROPOLITAN HOUSING AUTHORITY**  
ERROR! REFERENCE SOURCE NOT FOUND.

Prepared by:  
**UES**  
**CINCINNATI, OHIO**

Date: February 6, 2026

UES Project No.:  
**A25133.00696.000**

**SAFETY  
TEAMWORK  
RESPONSIVENESS  
INTEGRITY  
VALUE  
EXCELLENCE**





February 6, 2026

Ms. Alicia Morlatt  
Executive Director  
Clermont Metropolitan Housing Authority  
65 S Market Street  
Batavia, Ohio 45103

Re: Geotechnical Exploration  
Clermont County Veterans Village  
Batavia, Ohio  
Project No. A25133.00696.000

Dear Ms. Morlatt,

Presented in this report are the results of our geotechnical exploration completed for the Clermont County Veterans Village project in Amelia, Ohio. Our services were performed in general accordance with our Proposal A25133.00696.000, which was dated October 29, 2025 and authorized on November 19, 2025

We appreciate the opportunity to provide the geotechnical services for this project. If you have any questions regarding this report, or if we may be of any additional service to you, please do not hesitate to contact us.

Respectfully submitted,  
**UES PROFESSIONAL SOLUTIONS 25, LLC**

Josh Weaver, EIT  
Staff Engineer

JLW/JPH:jlw/jph

Copies submitted: CMHA (email)

James P. Haines, PE  
Geotechnical Department Manager





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## **1.0 INTRODUCTION**

UES prepared this geotechnical exploration report for the Clermont Metropolitan Housing Authority (CMHA) for the Clermont County Veterans Village project located at 2139 State Route 125 in Amelia, Ohio. Our services documented in this report were provided in general accordance with the terms and scope of services described in our Proposal A25133.00696.000, which was dated October 29, 2025.

The purposes of the geotechnical exploration were to evaluate the general subsurface profile at the site and the engineering properties of the soils and bedrock; and to develop recommendations for the geotechnical aspects of the design and construction of the project, as defined in our proposal. Our scope of services included site reconnaissance, geotechnical borings, laboratory testing, engineering analyses, and preparation of this report. At this time, a proposed grading plan has not been provided. Recommendations provided in this report should be considered preliminary until review of the proposed grading plan with respect to the conditions encountered is reviewed by UES.

## **2.0 PROJECT INFORMATION**

Our understanding of the project characteristics was derived from our correspondence with Model Group, as well as review of the provided Proposed Development Plan titled “2413-A Veterans Village Prelim Topo R3” and prepared by Creative Housing Solutions, LLC dated September 19, 2025.

We understand that the project will consist of a new residential development planned off of the south side of State Route 125, and to the east of the intersection between Whispering Woods Drive and State Route 125 in Amelia, Ohio. Based on review of the Preliminary Site Plan, the Clermont County Veterans Village development will include construction of: 1) 7 single-story one to two bedroom structures; 2) a pickle ball court; 3) a picnic shelter; and; 4) a single-story clubhouse building. In addition, a proposed roadway is planned to extend from State Route 125 to about 700 feet to the south. The proposed roadway provides access to the referenced structures and creates an oval shape the provides parking in the front of the structures. The proposed structures are generally positioned around the perimeter of the oval shaped roadway. UES assumes that the proposed structures will be slab on grade and planned to be supported with shallow depth spread type foundations. Proposed grading, finish-floor elevations, structural loads, etc. were not provided at this time; therefore, UES assumes excavations and/or fill of less than about 5 feet, and column, wall and floor slab loads of 150 kips, 4 kips per foot, and 100 psf respectively.

## **3.0 SITE CONDITIONS AND GEOLOGY**

The site is about 13 acres located on the south side of State Route 125 in Amelia, Ohio. At present, the site primarily consists of thickly wooded areas with the exception of a relatively open area at the north end of the site that contains an existing residential structure. Existing topography within the portion of the site planned for the structures generally ranges from about 864 within the central portion and slopes downward gently in all directions to near about elevation 858 to 852 feet amsl. Along the proposed access drive, the existing topography slopes downward to the north to an existing creek channel near about elevation 832 feet amsl.



According to Ohio Department of Natural Resources (ODNR) Ohio Geology Interactive Map, Illinoian age glacial (loam till) soils are present in the project site. The thickness of the overburden soil in the project area is estimated to be approximately 5 to 15 feet.

The underlying bedrock in the project area belongs to the Grant Lake Formation and Grant Lake Limestone Undifferentiated. These layers are comprised of interbedded shale and limestone and consist of approximately 50 to 80 percent shale and 20 to 50 percent limestone. The rock is described as gray to bluish gray and weathers light gray to yellowish gray. Bedding is thin to thick, irregular, can be planar, wavy, and nodular. The project area doesn't lie in a karst prone area. The potential geological hazards include toe cutting and erosion along the banks of natural drainages by water currents.

#### **4.0 SUBSURFACE EXPLORATION**

The subsurface exploration consisted of eleven (11) borings (numbered B-1 through B-11). The boring locations were selected by UES and were staked in the field by UES using a Real Time Kinetics (RTK) type GPS. The locations of the borings are shown on our Exploration Plan, which is included in Appendix A.

The borings were drilled on January 9, 2026 with an ATV drill rig advancing 2 ¼-inch inner diameter hollow stem augers (HSA), as indicated on the boring logs presented in Appendix B. Sampling of the overburden soils and bedrock was accomplished ahead of the augers at the depths indicated on the boring logs, with a 2-inch-outside-diameter (O.D.) split-barrel sampler in general accordance with the procedures outlined by ASTM D1586. Standard Penetration Tests (SPTs) were performed with the split-barrel sampler to obtain the standard penetration resistance or N-value<sup>1</sup> of the sampled material.

Observations for groundwater were made in the borings during drilling, and immediately at the completion of drilling.

A staff engineer from UES provided technical direction during the field exploration, observed drilling and sampling, assisted in obtaining samples, and prepared field logs of the material encountered.

Representative portions of the split-barrel samples were placed in glass jars with lids to preserve the in-situ moisture contents of the samples. The glass jars were marked and labeled in the field for identification when returned to our laboratory. The borings were backfilled with auger cuttings.

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<sup>1</sup> The standard penetration resistance, or N-value, is defined as the number of blows required to drive the split-barrel sampler 12 inches with a 140-pound hammer falling 30 inches. Since the split-barrel sampler is driven 18 inches or until refusal, the blows for the first 6 inches are for seating the sampler, and the number of blows for the final 12 inches is the N-value, which is reported as blows per foot (or bpf). Additionally, "refusal" of the split-barrel sampler occurs when the sampler is driven less than 6 inches with 50 blows of the hammer.



## **5.0 LABORATORY REVIEW AND TESTING**

Upon completion of the fieldwork, the samples recovered from the borings were transported to our Soil Mechanics Laboratory, where they were visually reviewed and classified by the Project Geotechnical Engineer.

Laboratory testing was performed on selected soil samples to estimate engineering and index properties. Laboratory testing of the selected soil samples included various combinations of the following tests: moisture content and Atterberg Limits. The results of these tests are summarized in the Tabulation of Laboratory Tests in Appendix D. Additionally, the results of laboratory tests are presented on the boring logs included within Appendix B.

The boring logs, which are included in Appendix B, were prepared by the Project Geotechnical Engineer based on the field logs, the visual classification of the soil samples in the laboratory, and the laboratory test results. Soil Classification Sheets are also included in Appendix B, which describe the terms and symbols used on the boring logs.

## **6.0 SUBSURFACE CONDITIONS**

### **6.1 Stratification**

Generally, the site is capped with a surficial layer of topsoil underlain by stiff to very stiff natural glacial soils, and residuum, which overlies shale bedrock.. Weak natural soils were present at/near the existing creek channel within isolated Boring B-10. Groundwater was encountered at Boring B-1 at a depth of about 13.5 feet. More specific descriptions of the subsurface conditions are provided in the subsections below, and on the boring logs containing detailed material descriptions are located in Appendix B.

#### **6.1.1 Topsoil**

Topsoil was encountered in each of the borings. The thickness of the topsoil varied from about 6 inches to 8 inches. Given the site is wooded, actual topsoil thicknesses and/or presence of highly organic soil, roots, etc., is expected to vary across the entire site and may exceed the thicknesses measured at the boring locations.

#### **6.1.2 Sediments**

Sediments deposited by flowing water were encountered in Boring B-10 beneath the topsoil and extended to a depth of about 3.0 feet below the existing ground surface. The sediment layer was described as soft high plasticity fat clay. It is expected that this sediment soil will be present along/near majority of the existing creek channel.

#### **6.1.3 Glacial Soils**

Glacial soils (or glacial till) are soils that have been deposited, transported, or reworked in place by the advancement or retreat of a glacier across the area. Glacial gouge is a type of glacial till that typically



refers to till that involves the glacier “gouging” into the underlying bedrock and mixing the “gouged” bedrock with the other soils and debris that are being transported by the advancement of the glacier. In general, glacial gouge includes a mixture of shale and limestone fragments, which may be sub-angular or sub-rounded by the gouging process, with clays, silty clays, sands, and gravels.

Glacial soils were encountered beneath the existing topsoil or sediments in each of the borings and extended to depths of about 2 to 13.9 feet. Generally, the glacial soils were cohesive soils described as very stiff moderate plasticity lean clay containing various amounts of sand and gravel. At Boring B-1, glacial till classified as Fat Clay was present between depths of about 3 and 8 feet. In Boring B-7, a layer of gravel, sand, and rock fragments was present from approximate depth of 11.7 to 13.9 feet. SPT N-Values of the cohesive glacial soils ranged overall from 9 to 41 blows per foot (bpf) with unconfined compressive strengths of 1.25 to greater than 4 tons per square foot (tsf) were recorded using a Hand Penetrometer indicating a stiff to very stiff consistency.

Three glacial soil samples were classified in the laboratory using Atterberg Limits tests. Among them two were lean clay (CL) and one was fat clay (CH). Liquid Limits (LL) of the cohesive soils were 51, 40 and 35 percent with corresponding Plasticity Indices (PI) of 30, 20, and 14 percent. Natural moisture contents were variable and recorded to range from about 9 to 25 percent.

#### **6.1.4 Residuum**

Residual soils (or residuum) are soils that have formed by the in-situ weathering of the underlying bedrock into a soil. Occasionally, layers of the bedrock (i.e., shale or limestone layers) may be encountered within the residual soils.

Residual soils were encountered in most borings beneath the glacial soils at depths of about 2 to 8 feet, and extended to the top of the bedrock surface. The residual soils encountered in the borings were very stiff to hard lean clay. Many of the residual soil samples obtained contained few to many rock fragments. SPT N-Values of the residuum soils ranged overall from 15 to 45 bpf and unconfined compressive strengths of 2 to in excess of 4.5 tsf were recorded using a Hand Penetrometer indicating very stiff to hard consistency. Atterberg Limits tests performed on samples of the residual soil yielded Liquid Limits of 23 and 45 percent, Plastic Limits of 14 and 19 percent with corresponding Plasticity Indices ranging from 19 to 26 percent.

#### **6.1.5 Bedrock:**

Bedrock was encountered and visually confirmed through SPT sampling in two of the eleven borings. The bedrock was encountered at depths ranging from 12 to 14 ft. below the existing ground surface in borings B-1, B-2, B-4, B-6, and B-7. Bedrock was encountered at depths ranging from 3 to 6 feet below the existing ground surface in borings B-3, B-10, and B-11. No bedrock was recovered during exploration in B-5, B-8 and B-9. The bedrock was described as a brown to gray weathered shale with limestone layers.





## **6.2 Groundwater Conditions**

As mentioned in Section 4.0, groundwater observations were made in the borings at the time of our exploration. Groundwater was encountered in Boring B-1 at a depth of about 13.5 feet during drilling and at about 11.5 feet at the completion of drilling. The remainder of the borings did not encounter groundwater at the time of drilling.

While a significant amount of groundwater was not encountered during the field exploration, it is common to encounter groundwater seepage or perched groundwater within interbedded granular layers in the glacial till, overburden soil/bedrock interface, and fractures within the bedrock. Additionally, groundwater levels and seepage amounts are expected to vary with time, location, season of the year, amounts of precipitation and water level in nearby natural drainages or creeks. Groundwater fluctuations should be considered during the design and construction of the project.

## **7.0 GEOTECHNICAL CONCLUSIONS/DISCUSSION**

Based on our engineering reconnaissance of the site, the borings, the visual examination of the recovered samples, the laboratory test results, our understanding of the proposed project, our engineering analyses, and our experience as Geotechnical Engineers in the Greater Cincinnati Area, UES concludes that the site appears suitable to support the proposed Veterans Village development. In general, proposed earthwork construction can be completed using conventional means and methods and new structures can be supported using shallow depth spread foundations bearing at conventional depths. However, it is UES opinion that the following items will have an impact on the proposed development and construction of the project: 1) the presence of dense woods and vegetation will likely require deeper stripping depths to remove slightly organic soil and root bulbs; 2) earthwork and/or building construction on or near the existing slopes associated with the existing creek channel will require specific earthwork and foundation construction considerations to prevent slope instability; 3) the weak sediment soils encountered along the creek channel are considered unsuitable for new fill placement and/or foundation support for a culvert crossing, embankment fill, etc.; and, 4) the presence of relatively shallow bedrock could have an impact on excavation activities at the site. Additional discussion with respect to the items noted above are provided in the subsections below.

### **7.1 Site Stripping**

The root matted topsoil thickness was measured to range from about 6 to 8 inches across the site. Given the wooded nature of the site, UES concludes that site stripping depths may exceed the root matted thickness of 6 to 8 inches to remove root bulbs and underlying highly organic soil that may be present in and around root systems, heavy vegetated areas, etc. For planning purposes, a stripping depth of up to 12 inches should be expected with localized areas extending potentially to 18 inches or more.

### **7.2 Construction Along Slopes**

Based on the existing grades and proposed site layout, UES expects that earthwork construction will be performed along the existing slopes in order to establish the proposed subgrade for the planned creek





crossing and/or to establish the proposed finish grade for the two buildings planned near the crest of the existing slope (i.e., the buildings within the vicinity of Borings B-6 and B-7). While the proposed site grades are not known, it should be expected that earthwork performed along the existing slopes will likely require toe key excavations into very stiff to hard residual soil or weathered bedrock to initiate new fill slopes, benching new fill into the existing slopes and potentially require the installation of subsurface drainage (i.e., blanket drains or bench drains) if groundwater or seepage is encountered. In addition, the two structures currently planned along the crest of the existing slope may require deeper foundation embedment and/or a minimum setback distance to reduce the potential for slope instability depending on the proposed grades, finish floor elevation, etc. Once the grading plan is available for the site, UES should review in order to provide specific recommendations pertaining to fill slope construction, subsurface drainage and foundation recommendations for structures along the crest of slopes.

### **7.3 Weak Sediment Soils**

Boring B-10 was performed near the embankment of the existing creek channel. Based on the findings, there is about 3 feet of soft silt/sediment material present that will need to be removed prior to placing new fill and/or prior to constructing foundations or structures associated with a culvert and/or bridge crossing. As a result, UES recommends including some contingency budget/allowance for over-excavations to remove soft sediment materials from along the existing creek channel in the proposed development areas.

### **7.4 Shallow Bedrock**

Weathered shale bedrock was generally present around 10 feet of the existing ground surface; however, was present within about 3 to 5 feet of the ground surface at Borings B-3, B-10 and B-11. Based on the proposed grading, it is possible that bedrock excavations may be required to install below grade utilities, foundations, etc. In general, the upper portion of the bedrock is relatively weathered and soft and should be able to be excavated with a large hydraulic track hoe. However, for excavations that will need to extend several feet into bedrock may require special or advanced bedrock removal techniques such as rock hammering or trenching.

## **8.0 GEOTECHNICAL RECOMMENDATIONS**

Our geotechnical engineering design and construction recommendations for the project are provided in the following sub sections. Please note the recommendations contained herein should be considered preliminary until a final grading plan, site layout, finish floor elevations, etc. are made available for review by UES.

### **8.1 Excavation Support**

Excavation support should be the responsibility of the Contractor. Excavation support should be designed and implemented such that excavations are adequately ventilated and braced, shored, and/or sloped in order to protect and ensure the safety of workers within and near the excavations and to protect adjacent ground, slopes, structures, and infrastructure. Federal, state, and local safety regulations should be



satisfied. The analyses, discussions, conclusions, and recommendations throughout this report are not to be interpreted as pre-engineering compliance with any safety regulation.

Normal earth excavation equipment should be suitable for excavation operations that are associated with the overburden soils and upper portion of the bedrock. All excavations should comply with OSHA requirements. For below-grade excavations, the natural cohesive soils should be classified as an OSHA Type A soil with slope excavations of 0.75H:1V. Temporary excavations extending more than 20 feet need to be reviewed, approved and/or designed by a licensed engineer. If groundwater is encountered or soils are overly wet, UES should be contacted to evaluate excavations. If soil types other than what had been mentioned above are encountered, UES should also be contacted to evaluate stability.

## **8.2 Site Preparation and Earthwork**

As stated in Section 2.0, proposed grading was not provided at the time of this report; we anticipate that relatively minimal earthwork will be required to achieve proposed grades for much of the site with the exception of the proposed creek crossing that may require more substantial earthwork construction.

The initial preparation of the site for grading should include the removal of trees, vegetation, heavy root systems, and topsoil from the proposed cut, fill, pavement, and structure areas. The topsoil and highly organic soil may be stockpiled for future use in landscaped areas, if permitted by specification, whereas the vegetation, including the heavy root systems, should be disposed of off-site in accordance with applicable regulations.

In addition, UES assumes that the existing residential structure will be demolished. UES recommends that any existing structures, utilities, etc. located within the limits of proposed structures or roadways, including a 10 feet wide buffer, be completely removed and the demolition debris hauled off to an appropriate landfill or stockpiled at the site if approved by the owner. UES should review the demolition activities after completion to confirm the suitability of the soils exposed by the demolition. UES recommends that excavations associated with demolition activities be backfilled with engineered fill meeting the requirements of this report.

### **8.2.1 Undercutting and Subgrade Preparation**

Following clearing and stripping the site of existing vegetation and topsoil and site demolition activities, the exposed subgrade within structure, pavement, and proposed fill areas should be thoroughly proof rolled using a heavily loaded piece of equipment (e.g., a loaded tandem-axle dump truck weighing at least 40,000 pounds) under the review of the Project Geotechnical Engineer, or a representative thereof. Although not anticipated, soft or yielding soils observed during the proof rolling should be undercut to stiff, non-yielding, cohesive soils or medium dense to dense, well-graded, cohesionless soils.

Where undercuts are performed, the excavations should be backfilled with new compacted fill satisfying the material and compaction requirements presented in Section 8.2.2. The undercut soils may be reused provided that they conform to the recommendations contained in this report regarding acceptable fill materials. We recommend that the Contract Documents include a bid item for the recommended



undercutting, as deemed necessary, and the replacement with new compacted and tested fill on a “per cubic yard of in-place compacted fill” basis.

### 8.2.2 Fill Materials, Placement, and Compaction

New fill materials should consist of approved on-site, non-organic, granular or clayey soils or approved borrow material including dense-graded aggregate (DGA or ODOT 304) or low plasticity clays (LL<50 and PI< 25) that are relatively free of topsoil, vegetation, trash, frozen materials, particles over 6 inches in maximum dimension, or other deleterious materials.

**Table 1. Percent compaction and moisture-conditioning recommendations for fill and backfill.**

Area	Minimum Percent Compaction <sup>a</sup>	Acceptable Moisture Content Range <sup>b</sup>
Structural <sup>c</sup>	98% of SPMDD	-2% to +3% of OMC
Non-structural	95% of SPMDD	-2% to +3% of OMC
Floor slab subgrade	98% of SPMDD	-2% to +3% of OMC
Pavement subgrade: ≤ 12 inches below subgrade	98% of SPMDD	±2% of OMC

Notes:

- <sup>a</sup> SPMDD = standard Proctor maximum dry density determined from ASTM D698.
- <sup>b</sup> OMC = optimum moisture content determined from ASTM D698.
- <sup>c</sup> Structural fill and backfill for foundations are defined as fill and backfill located within the zones of influence of structures. The zone of influence of a structure is defined as the area below the footprint of the structure and 2H:1V outward and downward projections from the bearing elevation of the structure.

The fill should be placed in shallow level lifts (or layers), 6 to 8 inches in loose thickness. Each lift should be moisture-conditioned to within the acceptable moisture content range provided Table 1 and compacted with a sheepsfoot (clayey soils) roller, smooth drum vibratory roller (granular soils), or self-propelled compactor to at least the minimum percent compaction indicated in the same table. Moisture-conditioning may include: aeration and drying of wetter soils; wetting of drier soils; and/or thoroughly mixing wetter and drier soils into a uniform mixture.

### 8.2.3 Earthwork Design and Construction Considerations

We recommend that the permanent cut and fill slopes for this project be designed not steeper than 3H:1V. Any new fill placed along existing sloping ground surface having a gradient of 10H:1V or steeper must be benched into the existing slope. Each bench should have a minimum width of 5 feet or as needed to accommodate compaction equipment and expose very stiff natural soils or bedrock throughout the bench. Depending on the proposed grading, a toe key excavation may be required at the base of proposed fill slopes. For this, the toe key excavation should be about 10 feet wide and extend at least 2 feet into the underlying shale bedrock. If groundwater or seepage is encountered during toe key or benching activities, the geotechnical engineer should be contacted to provide subsurface drainage recommendations.



Gentler slopes (flatter than 3H:1V) should be used whenever possible for ease of maintenance. Additionally, we recommend that the fill slopes be slightly overbuilt and then trimmed back to the design slope to achieve a well-compacted surface. Silt and/or sand soils should also be excluded from the surficial 5 feet of the fill slopes, as these materials are more susceptible to erosion.

Experience indicates that the overburden soils and upper portion of the shale bedrock can be excavated with conventional earthwork construction equipment (i.e., dozers, hoes, loaders, scrapers, etc.). For excavations that will extend several feet into the bedrock may require more advanced rock removal techniques such as hydraulic hammering or ripping. Maintaining the moisture content of bearing and subgrade soils within the acceptable ranges provided in Table 1 is very important during and after construction for the proposed structures. The clayey bearing and subgrade soils should not be allowed to become excessively wet or dried during or after construction, and measures should be taken to prevent water from ponding on these soils and to prevent these soils from desiccating during dry weather.

Groundwater is not expected to have a significant impact on the proposed site grading, but may impact excavating and backfilling of the deeper excavations. Consequently, the Contractor must be prepared to dewater the site and to remove groundwater flow and seepage that accumulates in excavations, on fill surfaces, or at subgrade levels.

Positive drainage should be established to promote the rapid drainage of surface water away from the proposed structures and to prevent the ponding of water adjacent to these structures. Finish grading in grass and landscaped areas should be sloped down and away from the structures at 10 percent for at least 10 feet, and then at a gradient of at least 2 percent beyond the initial 10 feet from the structures. Proposed pavements should drain away from the structures at a minimum of 2 percent. The final grades should direct the surface water to stormwater collection systems.

Due to the moisture-sensitivity of placing clay soils as fill, we recommend that the earthwork operations be carried out during the drier season of the year and that a sufficient gradient be maintained at the ground surface to prevent ponding of surface water. In our experience, the weather conditions are historically more favorable for earthwork during the months of May through October in southern Ohio. Regardless of the time of year, asphalt, concrete, or fill should not be placed over frozen or saturated soils, and frozen or saturated soils should not be used as compacted fill or backfill.

Best management practices (BMPs) should be implemented to reduce the effects of erosion and the siltation of adjacent properties. Upon completion of earthwork, disturbed areas should be stabilized. It is also recommended that riprap and/or suitable armoring be used at the outlets of storm sewers and headwalls to reduce flow velocities and protect against erosion.

### **8.3 Foundation Design and Construction**

As discussed in Section 7.0, the proposed residential structures, club house, etc. can be supported atop shallow depth spread foundations bearing on stiff to very stiff natural soil. For the two proposed buildings (i.e., within the vicinity of Borings B-6 and B-7) located along/near the existing slope, a deeper foundation embedment may be required to prevent slope instability and/or lateral movement of the foundations. UES



can provide additional foundation recommendations for these two structures once a final grading plan is available. Shallow foundation recommendations are provided below..

**8.3.1 Shallow Foundations**

Conventional spread foundations can be considered for the future buildings to bear directly atop stiff natural soil.. Spread foundations bearing on stiff natural soil can be designed for a maximum net allowable bearing pressure of 3,000 pounds per square foot (psf), full dead and full live load. Depending on the proposed finish floor elevations, it is possible some structure foundation may expose a combination of soil and bedrock at the design foundation bearing elevation which will create a differential bearing condition that could result in differential foundation movement (i.e., building foundations on soil will experience some settlement while foundations on bedrock will not) causing vertical cracks in foundations, foundation walls or masonry. Where this condition is encountered, UES recommends that either the entire building foundation be over-excavated to bear entirely within bedrock, or the portions of the foundation exposing bedrock should be over-excavated about 2 feet and re-established with engineered fill comprised of clayey type soils.

We recommend that the minimum lateral dimensions for continuous wall footings and isolated column footings be at least 18 and 24 inches, respectively. Exterior footings and footings in unheated interior areas should bear at least 32 inches below the lowest adjacent exterior/unheated grade for protection from frost penetration.

Where shallow foundations will be subjected to lateral loads, resistance to overturning and sliding may be evaluated using the parameters provided in Table 2. Furthermore, lateral resistance to sliding may be provided by a combination of friction and passive resistance; however, passive resistance should be ignored above the frost penetration depth of 30 inches. It also should be noted that the passive resistance parameters assume a level ground surface. If the ground is sloping down and away from the foundation in the area of passive resistance, we should be contacted to provide site-specific parameters. The frictional force should be based on dead normal loads only, and an appropriate factor of safety should be applied to the sliding resistance.

**Table 2. Design parameters for laterally loaded shallow foundations.**

Soil unit weight, $\gamma$ (pcf)	125
Internal angle of friction, $\phi$ (°)	26
Cohesion, $c$ (psf)	0
Ultimate coefficient of static friction, $\mu_{ult}$	0.30 for concrete cast on native soils

**8.3.2 General Shallow Foundation Construction Recommendations**

Loose, soft, wet, frozen, or otherwise disturbed materials should be removed from the bearing surfaces of the foundations prior to the placement of reinforcing steel and concrete. If a crusted or saturated surface develops at the bearing surface for a foundation, we recommend that it be skimmed to expose a



fresh surface before reinforcing steel and concrete are placed. Foundation concrete should be placed the same day as the excavation is made to prevent saturation or desiccation of the bearing surfaces.

Concrete mud mats may be placed over the bearing surfaces to protect the bearing materials from desiccation or softening via saturation. If concrete mud mats are utilized, the concrete should have a minimum compressive strength of 1,500 psi and a minimum thickness of 3 inches. The excavated bearing surface should be lowered at least the thickness of the mud mat, and the top of the mud mat should be at or below the design bearing elevation of the foundation. Prior to the placement of the concrete mud mat, the bearing surfaces should be cleaned of loose, soft, wet, frozen, or otherwise disturbed material.

Water should not be allowed to pond on top of either bearing soils within footing excavations, or on or around completed footings, to reduce potential softening or swelling of the bearing materials. Reinforcing steel and concrete should remain continuous through the foundation steps.

We recommend that foundation excavations be reviewed by the Project Geotechnical Engineer, or a representative thereof, prior to placing concrete to confirm that the bearing materials and surfaces are consistent with the design recommendations of this report.

## **8.4 Utility Construction**

The Contractor should be prepared to maintain the sides of excavations and to minimize the sloughing of soils and waste material into the trenches. Temporary shoring should be used wherever the bottom of the trench excavation will be lower than a 2H:1V outward and downward projection from the foundations of existing/proposed structures or the inverts or bearing elevations of infrastructure.

We anticipate that select granular backfill will be used as pipe bedding and pipe zone backfill for the utilities. We recommend that the granular backfill be limited to the pipe bedding and minimum required pipe/utility cover. The remainder of the utility trenches should be backfilled with flowable fill or compacted clayey soils up to design subgrade elevation to reduce the potential for water collecting in these trenches and being absorbed by the surrounding clays, causing heave of foundations, slabs, pavement, etc.

Granular bedding and backfill that exhibits a well-defined moisture-density relationship should be compacted and moisture-conditioned per the requirements presented in Table 1; otherwise, the granular material should be compacted to at least the minimum relative densities indicated in Table 3.





**Table 3. Relative density compaction recommendations for granular fill and backfill.**

Area	Minimum Relative Density <sup>a,b</sup>
Structural	80%
Non-structural	75%
Floor slab and pavement subbase	80%

Notes:

- <sup>a</sup> Relative density evaluated on the basis of the maximum and minimum index densities determined from ASTM D4253 and D4254, respectively.
- <sup>b</sup> For granular soils that exhibit a well-defined moisture-density relationship, refer Table 1 for minimum percent compaction and moisture-conditioning requirements.
- <sup>c</sup> Structural fill and backfill for foundations are defined as fill and backfill located within the zones of influence of structures. The zone of influence of a structure is defined as the area below the footprint of the structure and 2H:1V outward and downward projections from the bearing elevation of the structure.

Utility trench backfill should be placed in 6- to 8-inch-thick lifts with each lift compacted to at least the specified degree of compaction. Under no circumstances should the backfill be flushed in an attempt to obtain compaction.

If flowable fill is used, it should have a design strength of at least 30 psi for stability and not greater than 100 psi for future excavatability.

Prior to placing the bedding and utilities within the utility trench, soft, saturated, and compressible material should be removed from the bottom of the trench, exposing moist stiff soils or undisturbed bedrock.

If soft or unstable soils are encountered at the bottoms of the proposed utility trench excavations, we recommend that the soft or unstable materials be removed from below pipe invert for the full trench width, as necessary, and replaced with compacted crushed stone to provide a stable trench bottom. If the soil at the bottom of the over excavation is soft, the compacted crushed stone should be wrapped with a non-woven drainage geotextile (e.g., Mirafi 140N) to reduce the migration of fine-grained soils and fine granular bedding into the crushed stone. The depth of the undercut and crushed stone fill below the pipe invert may vary; however, the depth of undercut below pipe invert can be limited to a maximum of 24 inches. The crushed stone backfill should be placed and compacted in accordance with the recommendations for backfilling of this report. The specified pipe bedding should be placed over the compacted crushed stone and geotextile. We recommend that the Contract Documents include an item for the recommended undercutting of the soft, loose or unstable soils, as deemed necessary, and their replacement with the wrapped compacted crushed stone on a “per cubic yard of in-place compacted stone basis”.

## 8.5 Floor Slab

We anticipate that the floor slabs for the buildings will be designed as slab-on-grade concrete. Provided the site preparation and earthwork construction is performed in accordance with this report, the exposed subgrade should be suitable to provide support for the proposed floor slab. The concrete floor slab



thicknesses should be designed based stiff clay soils at this site providing a modulus of subgrade reaction (k) of 100 pounds per cubic inch (pci) for point loads<sup>2</sup>.

We recommend that the floor slab be underlain by a minimum 4-inch-thick subbase layer of dense-graded aggregate (DGA) or ODOT 304 to serve as a capillary break and reduce the potential for groundwater rising beneath and into the floor slab from the clayey subgrade via capillary action. The DGA subbase should be compacted per the requirements presented in Table 1. Immediately prior to placement of the granular base, we recommend that the top 8 inches of clayey floor slab subgrade be compacted and moisture-conditioned per the requirements presented in Table 1.

Additionally, we recommend that a vapor retarder/barrier be provided between the floor slab and the subbase where moisture-sensitive floor coverings will be applied to the floors, where moisture-sensitive products/packaging will be stored in direct contact with the floors, and where the humidity of the enclosed space is a concern. The effects of the vapor barrier on curling of the concrete floor slab should be considered in the mix design and placement of the concrete floor slab.

Care should be taken during slab-on-grade construction to not allow the subgrade to become desiccated or saturated. Additionally, consideration should be given to the timing of construction relative to the time of year and weather. If the slab construction is performed during relatively cold and wet weather, the use of cement-treatment of the subgrade may be beneficial to maintain progress during construction; otherwise, the subgrade is likely to be weakened by softening from saturation by rain and/or snow, leading to delays in reworking the subgrade to prepare it back to its pre-softened condition. A cost-benefit analysis may need to be performed to evaluate the need for cement-treatment.

We recommend that control joints be provided within the concrete slab-on-grade floors. These joints should be sealed to reduce surface water infiltration until the building is enclosed. The floor slab should be structurally separated from walls, columns, footings, and penetrations to allow independent movement of the floor.

## 8.6 Pavement Design and Construction

Proposed pavement subgrades should consist of low to moderate plasticity soils and be proofrolled with a tandem-axle dump loaded with at least 20 tons under the review of the Project Geotechnical Engineer, or representative thereof. At a minimum, UES recommends the immediate subgrade for pavements consist of at least 12 inches of low to moderate plasticity lean clay soil. Where high plasticity fat clay soil is present at the design subgrade, UES recommends the geotechnical engineer be consulted to provide recommendations for over-excavation and replacement or chemical stabilization depending on the actual plasticity of the subgrade soil. Soft or yielding soils observed during the proofroll should be undercut to stiff, non-yielding soils; however, for undercuts extending more than 2 feet below grade the geotechnical engineer should be consulted to provide supplemental recommendations. The undercut should be backfilled with new compacted fill satisfying the material and compaction requirements presented in

---

<sup>2</sup> For large area loads, the modulus of subgrade reaction would be lower, and settlement analyses would need to be completed to develop a specific modulus value for such loads.





Section 8.2. We recommend that the Contract Documents include an item for undercutting unsuitable soils and replacing them with new compacted and tested fill on a “per cubic yard of compacted replacement fill” basis. For pavement design, UES recommends a California Bearing Ratio (CBR) value of 3.

If the proposed pavement section includes an aggregate base, we recommend that caution be exercised so that the proposed aggregate base does not become saturated during or after construction. Water trapped in the aggregate base is capable of freezing, causing it to expand within the voids it occupies. Consequently, ice lenses may form and potentially heave the pavement. Furthermore, the thawing process can soften underlying cohesive subgrades, which reduces the pavement support provided by the subgrade, giving rise to “pumping” of the pavements under loads. Preferably, the aggregate base should be a free-draining material with provisions for draining the base through a system of underdrains.

Surface drainage should be directed away from the edges of proposed or existing pavements so that water does not pond next to pavements or flow onto pavements from unpaved areas. Such ponding or flow can cause deterioration of pavement subgrades and premature failure of pavements. If drainage ditches are used to intercept surface water before it reaches the pavements, the ditches should have an invert at least 6 inches below the pavement subgrade, and have a sufficient longitudinal gradient to rapidly drain the ditches and prevent ponding of water. In those areas where exterior grades do not fully slope away from the edges of the proposed pavement, we recommend that edge drains be installed along the perimeter of the pavement.

## 9.0 RECOMMENDED ADDITIONAL SERVICES

The conclusions and recommendations given in this report are based on: UES’s understanding of the proposed design and construction, as outlined in this report; site observations; interpretation of the exploration data; and our experience. **As indicated, UES should review the final grading plan and evaluate the planned grading with respect to the subsurface conditions encountered. Once reviewed an update to this report or addendum can be issued, if needed.** Since the intent of the design recommendations is best understood by UES, we recommend that UES be included in the final design and construction process, and be retained to review the project plans and specifications to confirm that the recommendations given in this report have been correctly implemented. We recommend that UES be retained to participate in pre-bid and preconstruction conferences to reduce the risk of misinterpretation of the conclusions and recommendations in this report relative to the proposed construction of the subject project.

Since actual subsurface conditions between boring locations may vary from those encountered in the borings, our design recommendations are subject to adjustment in the field based on the subsurface conditions encountered during construction. Therefore, we recommend that UES be retained to provide construction observation services as a continuation of the design process to confirm the recommendations in this report and to revise them accordingly to accommodate differing subsurface conditions. Construction observation is intended to enhance compliance with project plans and specifications. It is not insurance, nor does it constitute a warranty or guarantee of any type. Regardless



of construction observation, contractors, suppliers, and others are solely responsible for the quality of their work and for adhering to plans and specifications.

## 10.0 LIMITATIONS

This report has been prepared on behalf of, and for the exclusive use of, CMHA**Error! Reference source not found.** for specific application to the named project as described herein. If this report is provided to other parties, it should be provided in its entirety with all supplementary information. In addition, **Error! Reference source not found.** should make it clear that the information is provided for factual data only, and not as a warranty of subsurface conditions presented in this report.

UES has attempted to conduct the services reported herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions. The recommendations and conclusions contained in this report are professional opinions. The report is not a bidding document and should not be used for that purpose.

Our scope for this phase of the project did not include any environmental assessment or investigation for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors noted or unusual or suspicious items or conditions observed are strictly for the information of our client. Our scope did not include an assessment of the effects of flooding and erosion of creeks or rivers adjacent to or on the project site.

The analyses, conclusions, and recommendations contained in this report are based on the data obtained from the subsurface exploration. The field exploration methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Consequently, subsurface conditions may vary gradually, abruptly, and/or nonlinearly between sample locations and/or intervals.

The conclusions or recommendations presented in this report should not be used without UES's review and assessment if the nature, design, or location of the facilities is changed, if there is a substantial lapse in time between the submittal of this report and the start of work at the site, or if there is a substantial interruption or delay during work at the site. If changes are contemplated or delays occur, UES must be allowed to review them to assess their impact on the findings, conclusions, and/or design recommendations given in this report. UES will not be responsible for any claims, damages, or liability associated with any other party's interpretations of the subsurface data or with reuse of the subsurface data or engineering analyses in this report.

The recommendations included in this report have been based in part on assumptions about variations in site stratigraphy that may be evaluated further during earthwork and foundation construction. UES should be retained to perform construction observation and continue its geotechnical engineering service using observational methods. UES cannot assume liability for the adequacy of its recommendations when they are used in the field without UES being retained to observe construction.



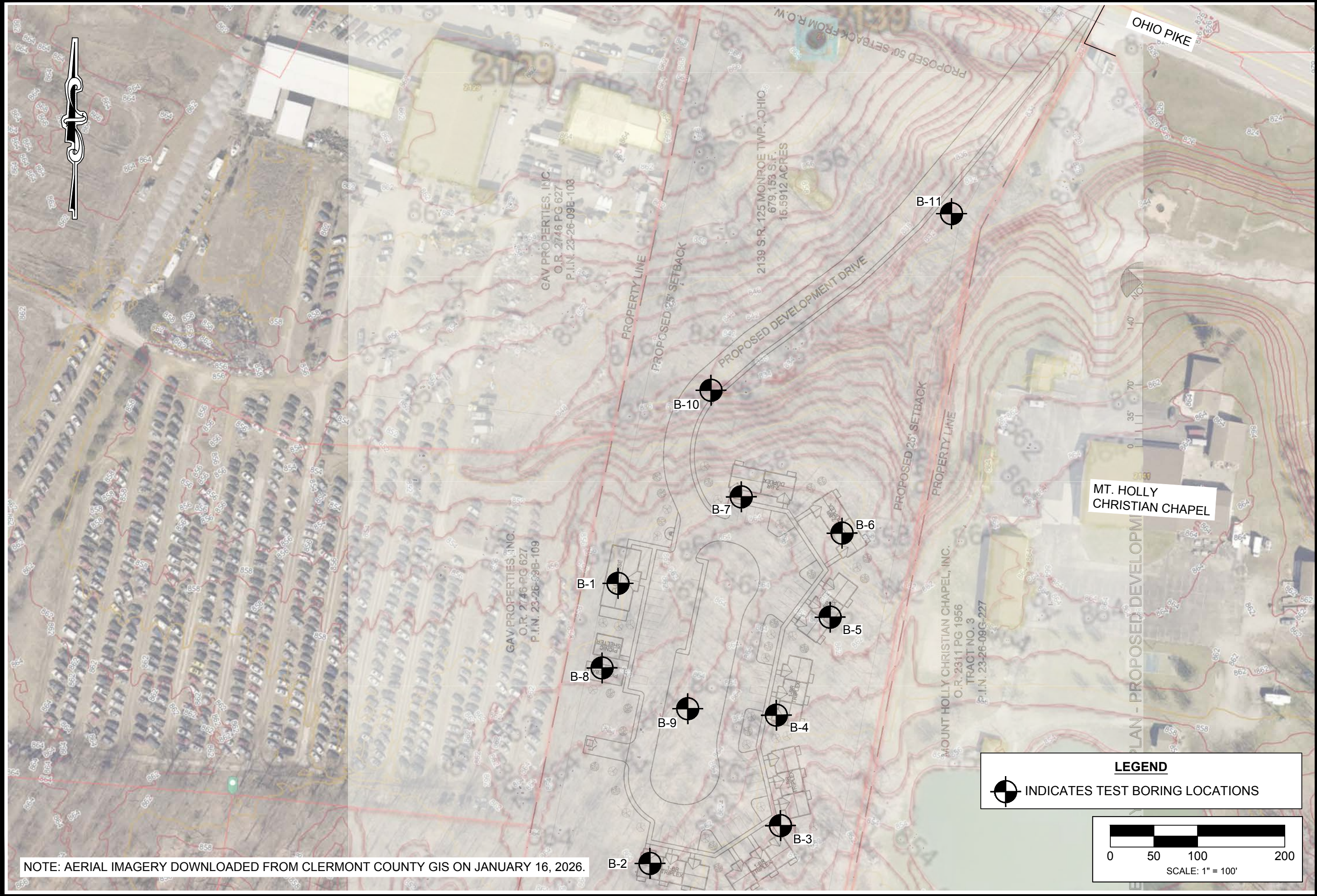
A copy of "Important Information about This Geotechnical-Engineering Report" that is published by the Geotechnical Business Council (GBC) of the Geoprofessional Business Association (GBA) is included in Appendix D for your review. The publication discusses some other limitations, as well as ways to manage risk associated with subsurface conditions.




## **APPENDIX A – PLANS**

Exploration Plan, Sheet No. 1







CLERMONT COUNTY  
VETERANS VILLAGE

Project:

BATAVIA, OHIO

Location:

EXPLORATION PLAN

Title:

MODEL GROUP

Client:

Date: 1/16/2026

Project No.: A25133.00696.000

Sheet No.: 1





## **APPENDIX B – BORING INFORMATION**

Boring Logs

Soil Classification Sheet

Depth To Cave In: N/A



# SOIL BORING B-2

SHEET 1 OF 1

Project: Clermont County Veterans Village  
Project Location: 2139 OH-125, Amelia, OH  
Location Accuracy: Approximate  
Coordinates: Latitude: 39.006874 Longitude: -84.173964  
Surface Elevation: 863.00'

Project Number: A25133.00696.000  
Client Name: Clermont Metropolitan Housing Authority  
Logged By: Josh Weaver  
Checked By: Jim Haines

Elevation (ft)	Graphic Log	Visual Classification and Remarks	Depth (ft)	Samples						Lab	
				Sample Number	Sample Graphic	Blow Counts	N-Value (bpf) (uncorrected)	Recovery Length (in)	Pocket Pen (tsf)	Moisture Content (%)	Atterberg Limits (LL-PL-PI)
863											
		<b>TOPSOIL [8 INCHES]</b> 0.7									
		Brown, Trace Gray <b>LEAN CLAY (CL)</b> trace oxide stains [Glacial Till] - moist, very stiff		1		4-7-7	14	18	2.25	15.0	
860											
				2		5-8-10	18	15	3.75	18.5	
			5								
		5.5									
		Brown <b>LEAN CLAY (CL)</b> trace gravel, trace rock fragments [Residuum] - moist, very stiff to hard		3		7-11-14	25	18	4.5+	10.7	23-14-9
855											
				4		8-13-17	30	18			
			10								
		11.7									
850		Olive Brown <b>HIGHLY WEATHERED SHALE</b> and gray interbedded limestone layers [Bedrock] - moist, extremely weak									
		14		5		50/6"	50/6"	6			
		Boring terminated at 14'									
			15								
845											
			20								
840											

## Remarks:

-

Date Completed: 01/09/2026  
Drilling Firm: Envirocore  
Rig Type: -  
Driller: Tom Beck  
Drilling Method: Auger  
Hammer Efficiency: -  
Hammer Type: Auto

## SAMPLE TYPES

☒ SS - Small Split Spoon

## WATER LEVEL OBSERVATIONS

Dry

Depth To Cave In: N/A





# SOIL BORING B-3

SHEET 1 OF 1

Project: Clermont County Veterans Village  
Project Location: 2139 OH-125, Amelia, OH  
Location Accuracy: Approximate  
Coordinates: Latitude: 39.007000 Longitude: -84.173441  
Surface Elevation: 857.40'

Project Number: A25133.00696.000  
Client Name: Clermont Metropolitan Housing Authority  
Logged By: Josh Weaver  
Checked By: Jim Haines

Elevation (ft)	Graphic Log	Visual Classification and Remarks	Depth (ft)	Samples						Lab
				Sample Number	Sample Graphic	Blow Counts	N-Value (bpf) (uncorrected)	Recovery Length (in)	Pocket Pen (tsf)	Moisture Content (%)
857.4										
		<b>TOPSOIL [7 INCHES]</b> 0.6								
855		Brown, Trace Gray <b>LEAN CLAY (CL)</b> with silt, trace oxide stains [Glacial Till] - moist, very stiff		1		5-7-8	15	18	2.75	16.2
				2		5-8-10	18	18	2.25	
			5							
				3		13-16-30	46	11		
850		Olive Brown <b>HIGHLY WEATHERED SHALE</b> [Bedrock] - moist, extremely weak 5.5								
				4		13-50/5"	50/5"	9		
		Boring terminated at 9.4' 9.4	10							
845										
840										
835										

## Remarks:

Date Completed: 01/09/2026  
Drilling Firm: Envirocore  
Rig Type: -  
Driller: Tom Beck  
Drilling Method: Auger  
Hammer Efficiency: -  
Hammer Type: Auto

## SAMPLE TYPES

☒ SS - Small Split Spoon

## WATER LEVEL OBSERVATIONS

Dry

Depth To Cave In: N/A



# SOIL BORING B-4

SHEET 1 OF 1

Project: Clermont County Veterans Village  
Project Location: 2139 OH-125, Amelia, OH  
Location Accuracy: Approximate  
Coordinates: Latitude: 39.007348 Longitude: -84.173466  
Surface Elevation: 862.40'

Project Number: A25133.00696.000  
Client Name: Clermont Metropolitan Housing Authority  
Logged By: Josh Weaver  
Checked By: Jim Haines

Elevation (ft)	Graphic Log	Visual Classification and Remarks	Depth (ft)	Samples					Lab	
				Sample Number	Sample Graphic	Blow Counts	N-Value (bpf) (uncorrected)	Recovery Length (in)	Pocket Pen (tsf)	Moisture Content (%)
862.4										
		<b>TOPSOIL [8 INCHES]</b> 0.7								
860		Brown, Trace Gray <b>LEAN CLAY (CL)</b> trace oxide stains [Glacial Till] - moist, very stiff		1		3-5-6	11	18	2.5	19.3
				2		3-6-7	13	18	3.0	21.0
			5							
		5.5								
855		Brown <b>LEAN CLAY (CL)</b> trace rock fragments [Glacial Till] - moist, very stiff to hard		3		3-6-7	13	16	4.5+	
		8								
		Brown <b>LEAN CLAY (CL)</b> trace limestone floaters, trace oxide stains [Residuum] - moist, very stiff to hard		4		4-10-15	25	15	4.5+	
			10							
850		11.7								
		Olive Brown <b>HIGHLY WEATHERED SHALE</b> and gray interbedded limestone layers [Bedrock] - moist, extremely weak								
				5		23-32-22	54	6		
			15							
		Boring terminated at 15'								
845										
840										

## Remarks:

-

Date Completed: 01/09/2026  
Drilling Firm: Envirocore  
Rig Type: -  
Driller: Tom Beck  
Drilling Method: Auger  
Hammer Efficiency: -  
Hammer Type: Auto

## SAMPLE TYPES

SS - Small Split Spoon

## WATER LEVEL OBSERVATIONS

Dry

Depth To Cave In: N/A










# SOIL BORING B-5

SHEET 1 OF 1

Project: Clermont County Veterans Village  
Project Location: 2139 OH-125, Amelia, OH  
Location Accuracy: Approximate  
Coordinates: Latitude: 39.007659 Longitude: -84.173256  
Surface Elevation: 861.60'

Project Number: A25133.00696.000  
Client Name: Clermont Metropolitan Housing Authority  
Logged By: Josh Weaver  
Checked By: Jim Haines

Elevation (ft)	Graphic Log	Visual Classification and Remarks	Depth (ft)	Samples						Lab		
				Sample Number	Sample Graphic	Blow Counts	N-Value (bpf) (uncorrected)	Recovery Length (in)	Pocket Pen (tsf)	Moisture Content (%)	Atterberg Limits (LL-PL-PI)	
861.6												
		<b>TOPSOIL</b> [8 INCHES] 0.7										
860		Brown, Trace Gray <b>LEAN CLAY (CL)</b> [Glacial Till] - moist, stiff to very stiff 3		1		3-4-5	9	18	2.0			
				2		4-7-9	16	16	4.5+	17.5	45-19-26	
		Orangish Brown, Trace Gray <b>LEAN CLAY (CL)</b> trace oxide stains [Residuum] - moist, very stiff to hard 5										
855					3		4-6-8	14	18	4.5+		
		Brown <b>LEAN CLAY (CL)</b> trace gravel, trace rock fragments [Residuum] - moist, very stiff to hard 8										
				4		5-6-9	15	18	4.5+			
850			10									
				5		16-50/3"	50/3"	6				
		Boring terminated at 14.2' 14.2	15									
845												
840			20									

## Remarks:

Date Completed: 01/09/2026  
Drilling Firm: Envirocore  
Rig Type: -  
Driller: Tom Beck  
Drilling Method: Auger  
Hammer Efficiency: -  
Hammer Type: Auto

## SAMPLE TYPES

SS - Small Split Spoon

## WATER LEVEL OBSERVATIONS

Dry

Depth To Cave In: N/A



# SOIL BORING B-6

SHEET 1 OF 1

Project: Clermont County Veterans Village  
Project Location: 2139 OH-125, Amelia, OH  
Location Accuracy: Approximate  
Coordinates: Latitude: 39.007925 Longitude: -84.173214  
Surface Elevation: 860.80'

Project Number: A25133.00696.000  
Client Name: Clermont Metropolitan Housing Authority  
Logged By: Josh Weaver  
Checked By: Jim Haines

Elevation (ft)	Graphic Log	Visual Classification and Remarks	Depth (ft)	Samples					Lab	
				Sample Number	Sample Graphic	Blow Counts	N-Value (bpf) (uncorrected)	Recovery Length (in)	Pocket Pen (tsf)	Moisture Content (%)
860.8										
860		<b>TOPSOIL</b> [6 INCHES] 0.5								
		Brown, Trace Gray <b>LEAN CLAY (CL)</b> [Glacial Till] - moist, stiff		1		3-5-7	12	18	1.25	17.5
		3								
		Brown, Trace Gray <b>LEAN CLAY (CL)</b> trace gravel, trace oxide stains [Glacial Till] - moist, very stiff to hard		2		5-9-12	21	18	4.5+	
855		5.5	5							
		Brown <b>LEAN CLAY (CL)</b> trace limestone fragments, trace gravel, trace oxide stains [Residuum] - moist, very stiff to hard		3		10-16-19	35	18	4.5+	9.3
850			10	4		5-14-16	30	16	4.5+	
		11.7								
		Brown <b>HIGHLY WEATHERED SHALE</b> and gray interbedded limestone layers [Bedrock] - moist, extremely weak								
				5		15-50-34	84	18		
845		15	15							
		Boring terminated at 15'								
840			20							

## Remarks:

-

Date Completed: 01/09/2026  
Drilling Firm: Envirocore  
Rig Type: -  
Driller: Tom Beck  
Drilling Method: Auger  
Hammer Efficiency: -  
Hammer Type: Auto

## SAMPLE TYPES

SS - Small Split Spoon

## WATER LEVEL OBSERVATIONS

Dry

Depth To Cave In: N/A



# SOIL BORING B-7

SHEET 1 OF 1

Project: Clermont County Veterans Village  
Project Location: 2139 OH-125, Amelia, OH  
Location Accuracy: Approximate  
Coordinates: Latitude: 39.008033 Longitude: -84.173624  
Surface Elevation: 862.00'

Project Number: A25133.00696.000  
Client Name: Clermont Metropolitan Housing Authority  
Logged By: Josh Weaver  
Checked By: Jim Haines

Elevation (ft)	Graphic Log	Visual Classification and Remarks	Depth (ft)	Samples					Lab	
				Sample Number	Sample Graphic	Blow Counts	N-Value (bpf) (uncorrected)	Recovery Length (in)	Pocket Pen (tsf)	Moisture Content (%)
862		<b>TOPSOIL</b> [8 INCHES] 0.7								
860		Brown, Trace Gray <b>LEAN CLAY (CL)</b> trace oxide stains [Glacial Till] - moist, very stiff 3		1		3-4-5	9	17	3.0	18.8
		Brown <b>LEAN CLAY (CL)</b> trace gravel, trace rock fragments [Glacial Till] - moist, very stiff to hard		2		6-12-16	28	18	4.5+	9.4
855			5	3		14-22-19	41	18	4.5+	
				4		6-14-22	36	18	4.5+	
850		Brown <b>SAND AND GRAVEL</b> [Glacial Till] - moist, dense 11.7	10							
		Brown <b>HIGHLY WEATHERED SHALE</b> [Bedrock] - moist, extremely weak 13.9		5		8-24-16	40	13		
		Boring terminated at 15'	15							
845										
840			20							

## Remarks:

Date Completed: 01/09/2026  
Drilling Firm: Envirocore  
Rig Type: -  
Driller: Tom Beck  
Drilling Method: Auger  
Hammer Efficiency: -  
Hammer Type: Auto

## SAMPLE TYPES

SS - Small Split Spoon

## WATER LEVEL OBSERVATIONS

Dry

Depth To Cave In: N/A





# SOIL BORING B-9

SHEET 1 OF 1

Project: Clermont County Veterans Village  
Project Location: 2139 OH-125, Amelia, OH  
Location Accuracy: Approximate  
Coordinates: Latitude: 39.007363 Longitude: -84.173824  
Surface Elevation: 864.50'

Project Number: A25133.00696.000  
Client Name: Clermont Metropolitan Housing Authority  
Logged By: Josh Weaver  
Checked By: Jim Haines

Elevation (ft)	Graphic Log	Visual Classification and Remarks	Depth (ft)	Samples						Lab	
				Sample Number	Sample Graphic	Blow Counts	N-Value (bpf) (uncorrected)	Recovery Length (in)	Pocket Pen (tsf)	Moisture Content (%)	Atterberg Limits (LL-PL-PI)
864.5											
		<b>TOPSOIL [7 INCHES]</b> 0.6									
		Orangish Brown, Trace Gray <b>LEAN CLAY (CL)</b> [Glacial Till] - moist, stiff to very stiff		1		2-4-7	11	18	2.0	25.3	40-20-20
		3									
860		Brown <b>LEAN CLAY (CL)</b> trace oxide stains [Residuum] - moist, very stiff		2		4-4-7	11	18	2.75		
		5.5	5								
		Orangish Brown <b>LEAN CLAY (CL)</b> trace oxide stains, trace limestone fragments [Residuum] - moist, very stiff		3		6-11-12	23	18	3.5		
855				4		7-12-17	29	18	4.5+		
		10	10								
		Boring terminated at 10'									
850											
			15								
845											
			20								
840											

## Remarks:

Date Completed: 01/09/2026  
Drilling Firm: Envirocore  
Rig Type: -  
Driller: Tom Beck  
Drilling Method: Auger  
Hammer Efficiency: -  
Hammer Type: Auto

## SAMPLE TYPES

SS - Small Split Spoon

## WATER LEVEL OBSERVATIONS

Dry

Depth To Cave In: N/A



# SOIL BORING B-10

SHEET 1 OF 1

Project: Clermont County Veterans Village  
Project Location: 2139 OH-125, Amelia, OH  
Location Accuracy: Approximate  
Coordinates: Latitude: 39.008367 Longitude: -84.173754  
Surface Elevation: 835.60'

Project Number: A25133.00696.000  
Client Name: Clermont Metropolitan Housing Authority  
Logged By: Josh Weaver  
Checked By: Jim Haines

Elevation (ft)	Graphic Log	Visual Classification and Remarks	Depth (ft)	Samples					
				Sample Number	Sample Graphic	Blow Counts	N-Value (bpf) (uncorrected)	Recovery Length (in)	Pocket Pen (tsf)
835.6									
835		<b>TOPSOIL</b> [8 INCHES] 0.7							
		Brown <b>FAT CLAY (CH)</b> [Sediment] - moist, very soft 3		1		3-4-3	7	18	
		Brown <b>LEAN CLAY (CL)</b> trace roots [Glacial Till] - moist, stiff 5.5		2		3-3-4	7	10	1.5
830		Olive Brown <b>HIGHLY WEATHERED SHALE</b> and gray interbedded limestone layers [Bedrock] - moist, extremely weak 8.8		3		10-25-27	52	17	
		Boring terminated at 8.8'		4		50/4"	50/4"	4	
825			10						
820			15						
815			20						

## Remarks:

Date Completed: 01/09/2026  
Drilling Firm: Envirocore  
Rig Type: -  
Driller: Tom Beck  
Drilling Method: Auger  
Hammer Efficiency: -  
Hammer Type: Auto

## SAMPLE TYPES

SS - Small Split Spoon

## WATER LEVEL OBSERVATIONS

Dry

Depth To Cave In: N/A












# SOIL BORING B-11

SHEET 1 OF 1

Project: Clermont County Veterans Village  
Project Location: 2139 OH-125, Amelia, OH  
Location Accuracy: Approximate  
Coordinates: Latitude: 39.008937 Longitude: -84.172797  
Surface Elevation: 831.80'

Project Number: A25133.00696.000  
Client Name: Clermont Metropolitan Housing Authority  
Logged By: Josh Weaver  
Checked By: Jim Haines

Elevation (ft)	Graphic Log	Visual Classification and Remarks	Depth (ft)	Samples						Lab	
				Sample Number	Sample Graphic	Blow Counts	N-Value (bpf) (uncorrected)	Recovery Length (in)	Pocket Pen (tsf)	Moisture Content (%)	Atterberg Limits (LL-PL-PI)
831.8											
830		<b>TOPSOIL</b> [8 INCHES] 0.7		1		4-5-6	11	16	2.0	22.5	35-21-14
		Brown <b>LEAN CLAY (CL)</b> [Glacial Till] - moist, very soft 2									
		Brown <b>LEAN CLAY (CL)</b> trace rock fragments [Residuum] - moist, stiff to very stiff 3									7.6
		Olive Brown <b>HIGHLY WEATHERED SHALE</b> and gray interbedded limestone layers [Bedrock] - moist, extremely weak	5	2		14-21-22	43	18			
				3		12-26-50/2"	76/8"	8			
825											
		Boring terminated at 7.2' 7.2									
			10								
820											
			15								
815											
			20								
810											

## Remarks:

Date Completed: 01/09/2026  
Drilling Firm: Envirocore  
Rig Type: -  
Driller: Tom Beck  
Drilling Method: Auger  
Hammer Efficiency: -  
Hammer Type: Auto

## SAMPLE TYPES

☒ SS - Small Split Spoon

## WATER LEVEL OBSERVATIONS

Dry

Depth To Cave In: N/A



## **APPENDIX C– INCLUDED REFERENCE DOCUMENTS**

NAVFAC DM-7.02 Table 1: Typical Properties of Compacted Soils

Naval Facilities Engineering Systems Command: DM-7.02 Foundations [and] Earth Structures Design Manual, Table 1 Typical Properties of Compacted Soils

Group Symbol	Soil Type	Range of Maximum Dry Unit Weight, pcf	Range of Optimum Moisture, percent	Typical Value of Compression		Typical Strength Characteristics				Typical Coefficient of Permeability, ft./min.	Range of CBR Values	Range of Subgrade Modulus K, pci
				At 1.4 tsf (20 psi) Percent of original height	At 3.6 tsf (50 psi)	Cohesion (as compacted), psf	Cohesion (saturated), psf	Effective Stress Envelope, degrees	Tan Ø			
GW	Well graded clean gravels, gravel-sand mixtures	125-135	11-8	0.3	0.6	0	0	>38	>0.79	5x10 <sup>-2</sup>	40-80	300-500
GP	Poorly graded clean gravels, gravel-sand mix	115-125	14-11	0.4	0.9	0	0	>37	>0.74	10 <sup>-1</sup>	30-60	250-400
GM	Silty gravels, poorly graded gravel-sand-silt	120-135	12-8	0.5	1.1	-	-	>34	>0.67	>10 <sup>-6</sup>	20-60	100-400
GC	Clayey gravels, poorly graded gravel-sand-clay	115-130	14-9	0.7	1.6	-	-	>31	>0.60	>10 <sup>-7</sup>	20-40	100-300
SW	Well graded clean sands, gravelly sands	110-130	16-9	0.6	1.2	0	0	38	0.79	>10 <sup>-3</sup>	20-40	200-300
SP	Poorly graded clean sands, sand-gravel mix	100-120	21-12	0.8	1.4	0	0	37	0.74	>10 <sup>-3</sup>	10-40	200-300
SM	Silty sands, poorly graded sand-silt mix	110-125	16-11	0.8	1.6	1050	420	34	0.67	5x >10 <sup>-5</sup>	10-40	100-300
SM-SC	Sand-silt clay mix with slightly plastic fines	110-130	15-11	0.8	1.4	1050	300	33	0.66	2x >10 <sup>-6</sup>	5-30	100-300
SC	Clayey sands, poorly graded sand-clay-mix	105-125	19-11	1.1	2.2	1550	230	31	0.60	5x >10 <sup>-7</sup>	5-20	100-300
ML	Inorganic silts and clayey silts	95-120	24-12	0.9	1.7	1400	190	32	0.62	>10 <sup>-5</sup>	15 or less	100-200
CL-ML	Mixture of inorganic silt and clay	100-120	22-12	1.0	2.2	1350	460	32	0.62	3x >10 <sup>-7</sup>	-	
CL	Inorganic calys of low to medium plasticity	95-120	24-12	1.3	2.5	1800	270	28	0.54	>10 <sup>-7</sup>	15 or less	50-200
OL	Organic silts and silt-clays, low plasticity	80-100	33-21	-	-	-	-	-	-	-	5 or less	50-100
MH	Inorganic clayey silts, elastic silts	70-95	40-24	2.0	3.8	1500	420	25	0.47	5x >10 <sup>-7</sup>	10 or less	50-100
CH	Inorganic clays of high plasticity	75-105	36-19	2.6	3.9	7150	230	19	0.35	>10 <sup>-7</sup>	15 or less	50-150
OH	Organic clays and silty clays	65-100	45-21	-	-	-	-		-	-	5 or less	25-100

- Notes:
- a. All properties are for condition of “Standard Proctor” maximum density, except for k and CBR which are for “modified Proctor” maximum density.
  - b. Typical strength characteristics are for effective strength envelopes and are obtained from USBR [United States Bureau of Reclamation] data.
  - c. Compression values are for vertical loading with complete lateral confinement,
  - d. (>) indicates that typical property is greater than the value shown. (-) indicates insufficient data available for an estimate.



## **APPENDIX D – LABORATORY TEST DATA**

Tabulation of Laboratory Tests

Atterberg Limits Test Forms



## TABULATION OF MOISTURE CONTENT LABORATORY TEST RESULTS

Client:	Model Group
Project No.:	A25133.00696.000
Project:	Clermont County Veterans Village - GEO

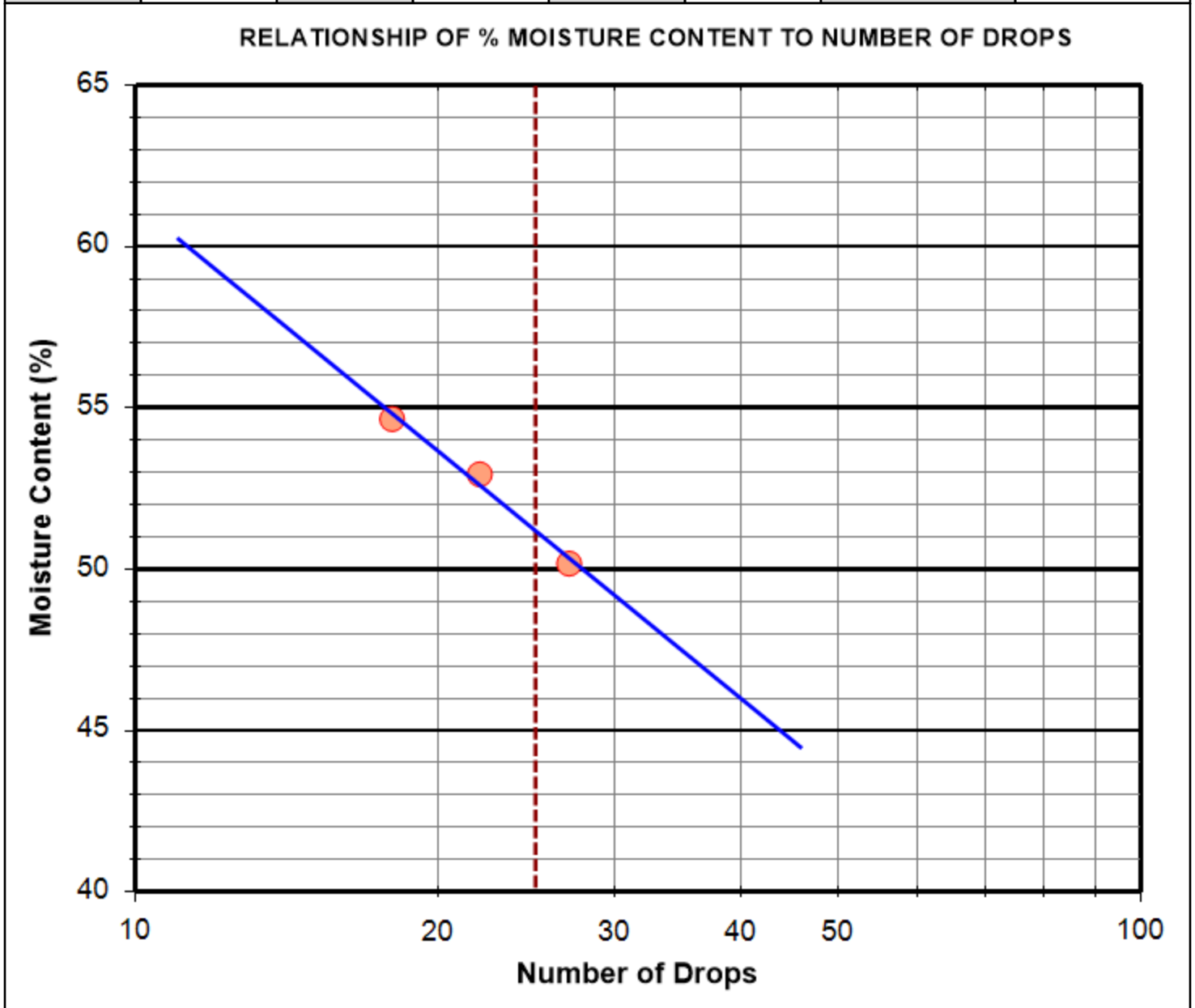
Boring Nbr	Depth Top	Sample Ref	Sample Id	Sample Type	WWT	DWT	Tare	Test Date	WC
B-1	1		S-1		66.56	57.11	14.55	1/20/2026	22.2
B-1	3.5		S-2		65.67	57.39	15.12	1/20/2026	19.6
B-2	1		S-1		66.22	59.43	14.05	1/20/2026	15.0
B-2	3.5		S-2		65.89	57.94	15.07	1/20/2026	18.5
B-2	6		S-3		71.81	66.8	20.04	1/20/2026	10.7
B-3	1		S-1		63.82	56.86	13.87	1/20/2026	16.2
B-4	1		S-1		63.43	55.33	13.27	1/20/2026	19.3
B-4	3.5		S-2		64.7	55.95	14.34	1/20/2026	21.0
B-5	3.5		S-2		63.33	55.89	13.67	1/20/2026	17.6
B-6	1		S-1		68.08	60.21	15.21	1/20/2026	17.5
B-6	6		S-3		67.29	62.82	14.92	1/20/2026	9.3
B-7	1		S-1		71.3	63.3	20.83	1/20/2026	18.8
B-7	3.5		S-2		65.37	61.04	15.09	1/20/2026	9.4
B-9	1		S-1		67.09	56.61	15.1	1/20/2026	25.3
B-11	1		S-1		67.13	57.59	15.23	1/20/2026	22.5

B-11	3.5		S-2		64.83	61.25	14.4	1/20/2026	7.6
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# LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS ASTM D-4318

Client:	Model Group					Project No.:	A25133.00696.000	
Project:	Clermont County Veterans Village - GEO, Batavia, OH					Date:	1/23/2026	
Boring No.:	B-1	Sample No.:	S-2	Depth (ft.):	3.5	Sample Preparation Condition:	Air Dried	
Sample Description:		Brown Fat Clay					In Situ Moisture Content:	
							15.9%	
Liquid Limit:	51	Plastic Limit:	21	Plastic Index:	30	USCS:	CH	

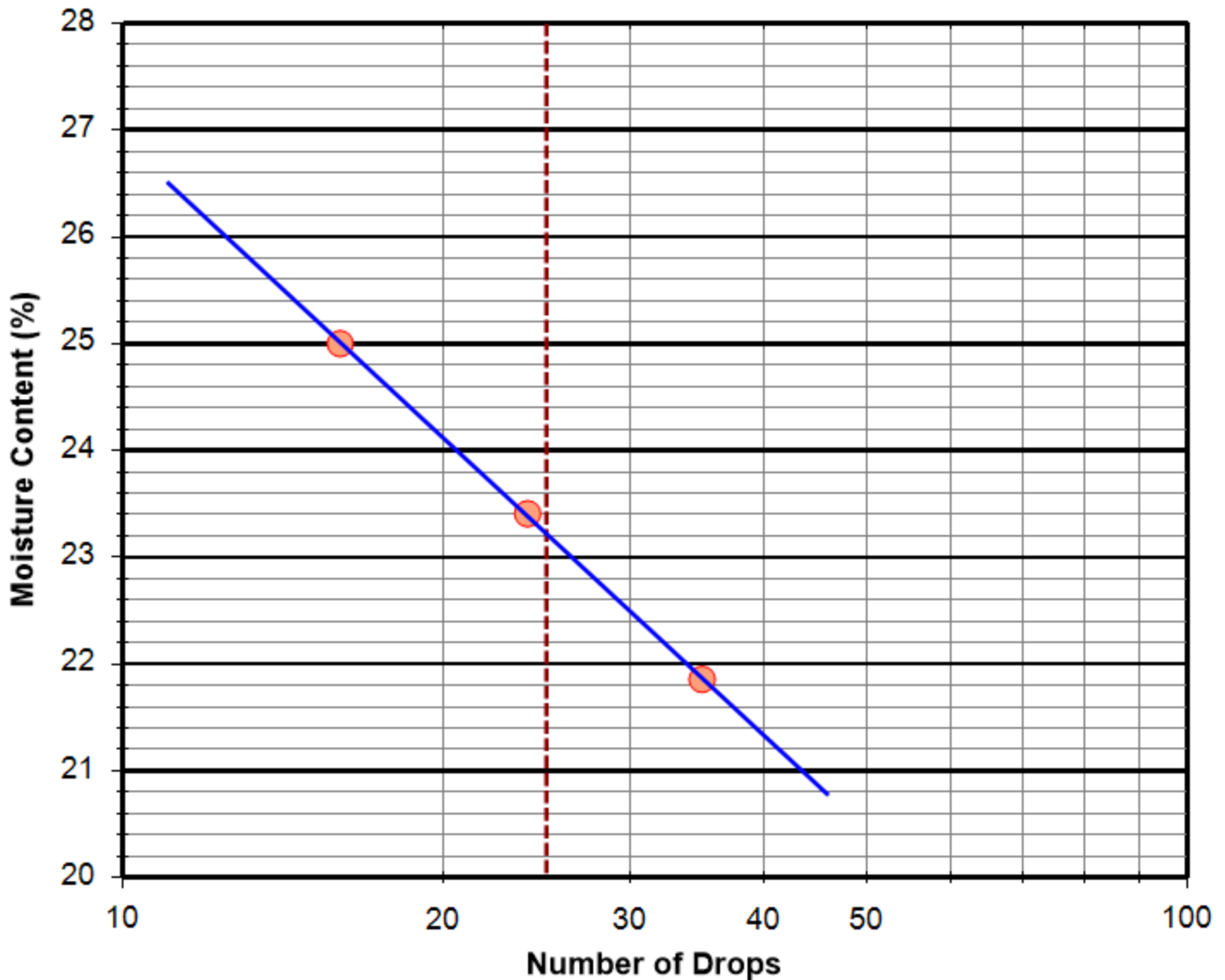




# LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS ASTM D-4318

Client:	Model Group					Project No.:	A25133.00696.000	
Project:	Clermont County Veterans Village - GEO, Batavia, OH					Date:	1/23/2026	
Boring No.:	B-2	Sample No.:	S-3	Depth (ft.):	6	Sample Preparation Condition:	Air Dried	
Sample Description:		Brown Fat Clay					In Situ Moisture Content:	
							7.3%	
Liquid Limit:	23	Plastic Limit:	14	Plastic Index:	9	USCS:	CL	

RELATIONSHIP OF % MOISTURE CONTENT TO NUMBER OF DROPS

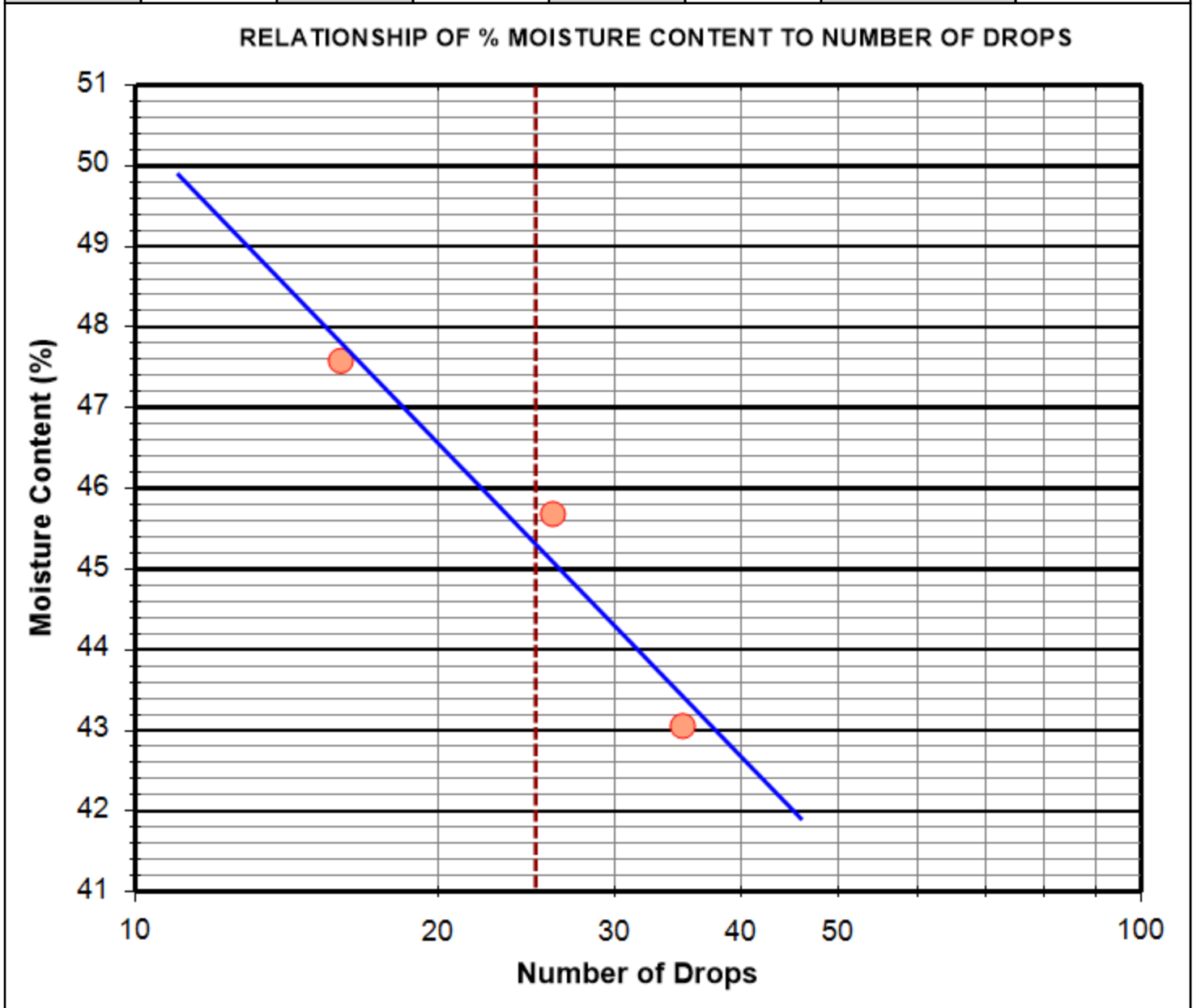






# LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS ASTM D-4318

Client:	Model Group					Project No.:	A25133.00696.000	
Project:	Clermont County Veterans Village - GEO, Batavia, OH					Date:	1/28/2026	
Boring No.:	B-5	Sample No.:	S-2	Depth (ft.):	3.5	Sample Preparation Condition:	Air Dried	
Sample Description:							In Situ Moisture Content:	
							14.0%	
Liquid Limit:	45	Plastic Limit:	19	Plastic Index:	26	USCS:	CL	

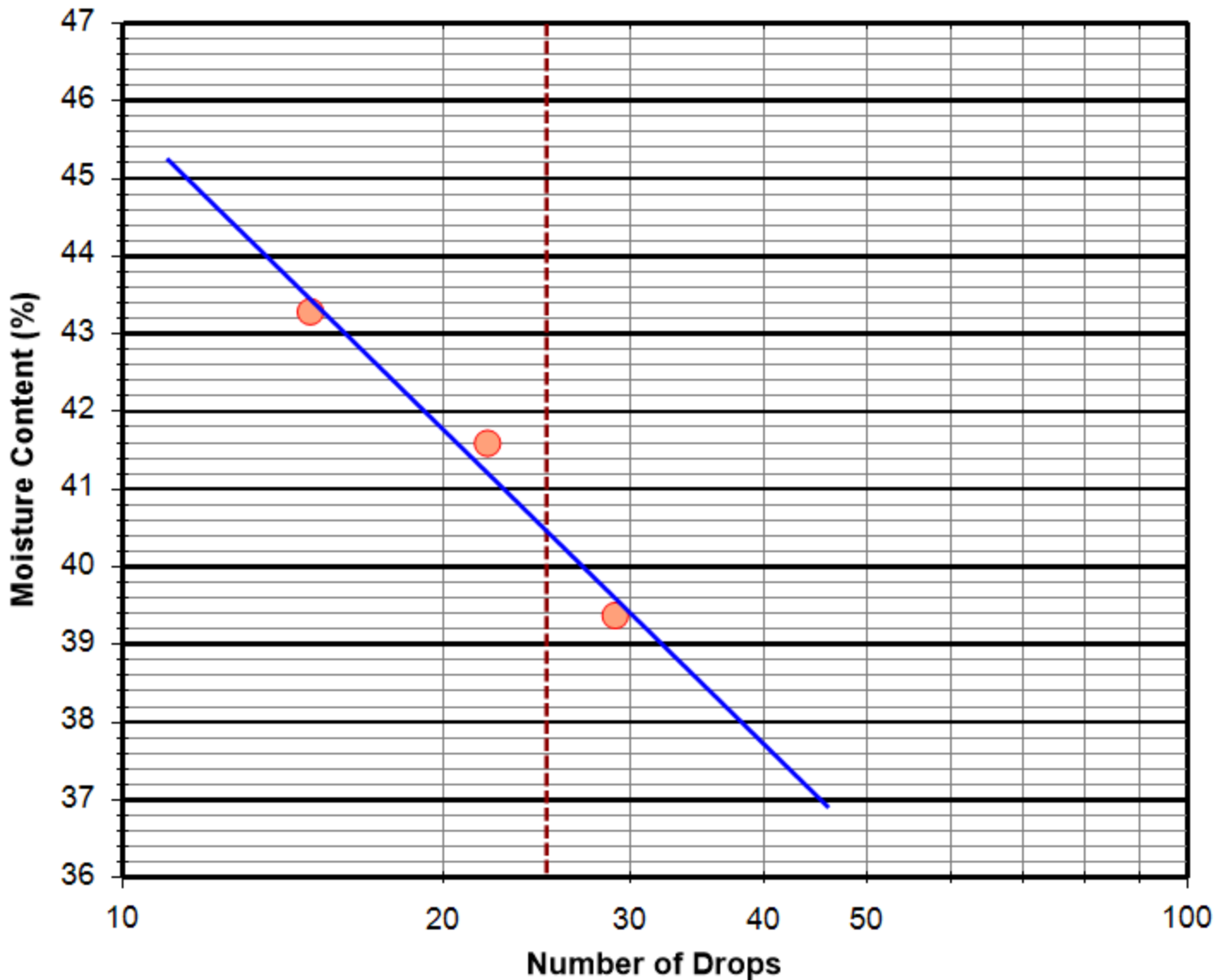




# LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS ASTM D-4318

Client:	Model Group					Project No.:	A25133.00696.000	
Project:	Clermont County Veterans Village - GEO, Batavia, OH					Date:	1/23/2026	
Boring No.:	B-9	Sample No.:	S-1	Depth (ft.):	1	Sample Preparation Condition:	Air Dried	
Sample Description:							In Situ Moisture Content:	
							19.7%	
Liquid Limit:	40	Plastic Limit:	20	Plastic Index:	20	USCS:	CL	

RELATIONSHIP OF % MOISTURE CONTENT TO NUMBER OF DROPS

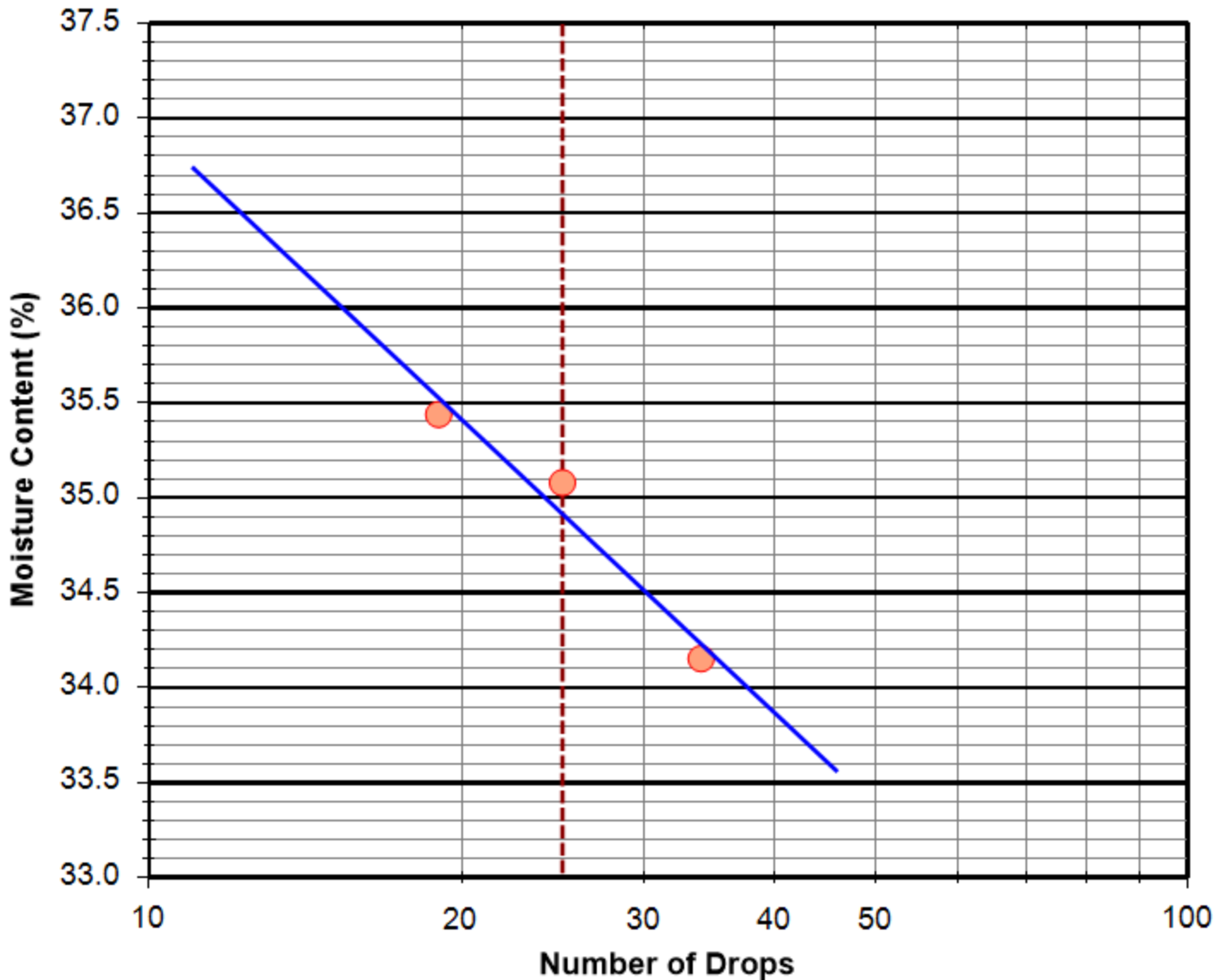




# LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS ASTM D-4318

Client:	Model Group					Project No.:	A25133.00696.000	
Project:	Clermont County Veterans Village - GEO, Batavia, OH					Date:	1/28/2026	
Boring No.:	B-11	Sample No.:	S-1	Depth (ft.):	1.0	Sample Preparation Condition:	Air Dried	
Sample Description:							In Situ Moisture Content:	
							18.5%	
Liquid Limit:	35	Plastic Limit:	21	Plastic Index:	14	USCS:	CL	

RELATIONSHIP OF % MOISTURE CONTENT TO NUMBER OF DROPS





## **APPENDIX E - IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL- ENGINEERING REPORT**

# Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

## Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply this report for any purpose or project except the one originally contemplated.*

## Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

## Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an

assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

## Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by:* the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

## Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

## A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

## A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

### Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

### Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

### Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help

others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

### Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

### Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

### Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.



8811 Colesville Road/Suite G106, Silver Spring, MD 20910

Telephone: 301/565-2733 Facsimile: 301/589-2017

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SECTION 0101100 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Work covered by the Contract Documents.
  2. Work phases.
  3. Work under other contracts.
  4. Use of premises.
  5. Owner's occupancy requirements.
  6. Specification formats and conventions.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification:

Veteran's Village  
2139 State Route 125  
Monroe Township, Ohio 45102

B. Owner:

Clermont Housing Corporation  
65 South Market Street  
Batavia, Ohio 45103  
(513) 732-6010

Executive Director: Ms. Alicia Morlatt

C. Architect:

Creative Housing Solutions, Inc.  
935 Lenox Place, Cincinnati, Ohio 45229  
(513) 961-4400

Project Architect: Brian T. Yacucci, RA, NCARB  
Architect of Record: Donald L. Dudrow, Jr., RA, NCARB, AIA, CEM.

D. The Work generally consists of:

1. Construction of seven (7) residential buildings containing sixteen (16) one-bedroom and three (3) two-bedroom apartments.
2. Construction of a clubhouse containing community spaces and offices
3. Site improvements including development road, parking lots, sidewalks, picnic shelter, flagpole, pickleball court and other site improvements
4. Construction of site utilities and infrastructure.

E. Project will be constructed under one general contract. The contract period shall be 360 calendar days from the date of the Notice to Proceed.

### 1.3 WORK UNDER OTHER CONTRACTS

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.
- B. Contract Documents: Project Manual and Drawings.
- C. Discrepancies: If a discrepancy occurs between the drawings and the specifications the more expensive material, means or method shall be utilized. Contractor shall report all discrepancies to the architect immediately.

### 1.4 USE OF PREMISES

- A. General: Contractor shall have unlimited use of premises for construction operations. Contractor shall review Phase I Environmental Report for restrictions at creeks and drainageways on the site.

### 1.5 OWNER'S OCCUPANCY REQUIREMENTS

- A. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of the site/buildings, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
  - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
  - 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
  - 3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of building.
  - 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.
- B. General: Contractor shall have use of premises designated for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- C. Unit Acceptance: All work in the units to be inspected must be completed prior to calling for inspection. The Contractor is allowed one (1) punch-inspection and one (1) final inspection for each unit. If more than two (2) inspections are required for a particular unit due to the Contractor's failure to satisfactorily complete the punch list items, the Contractor will be charged \$850 per unit. This amount will be deducted from any contract amounts due the Contractor.

### 1.6 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 2004 50-division format and CSI/CSC's "MasterFormat" numbering system.
  - 1. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense



requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
  - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

#### 1.7 PERMITS

- A. Permits, licenses, and Certificates: The Contractor is responsible for the cost of any and all permits, inspections, licenses and other regulatory requirements associated with this project. The Contractor shall pay for and obtain any; Building, Plumbing, HVAC, Electrical, Zoning, and environmental permits and inspections required for this work. The cost of these permits, inspections, licenses and other regulatory requirements shall be included in the Base Bid. Note: the Architect shall apply for General Building Permit/Plans Examination prior to commencement of construction. Owner shall be responsible for plans examination fees. Contractor shall pay for all Processing Fees and all actual permit costs, and shall include such in the Base Bid.
- B. The Contractor shall be responsible for complying with all applicable codes and regulations governing the work of this contract, regardless of whether the scope of work required for compliance is described on the drawings, or described in the specifications.

#### 1.8 STORM WATER

- A. A copy of the stormwater calculations has been prepared by Kleinger's (civil engineer) The report may be accessed via the following link <https://chsonline.egnyte.com/dl/dQGyR6hGdcfc>

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

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## SECTION 013000 - SUBMITTALS

### 1.1 GENERAL

- A. Submittal Procedures: Coordinate submittal preparation with construction, fabrication, other submittals, and activities that require sequential operations. Transmit in advance of construction operations to avoid delay.
1. Coordinate submittals for related operations to avoid delay because of the need to review submittals concurrently for coordination. The Architect reserves the right to withhold action on a submittal requiring coordination until related submittals are received.
  2. Processing: Allow 2 weeks for initial review. Allow more time if the Architect must delay processing to permit coordination. Allow 2 weeks for reprocessing.
    - a. No extension of Contract Time will be authorized because of failure to transmit submittals sufficiently in advance of the Work to permit processing.
  3. Submittal Preparation: Place a permanent label on each submittal for identification. Provide a 4- by 5-inch space on the label or beside title block to record review and approval markings and action taken. Include the following information on the label for processing and recording action taken.
    - a. Project name.
    - b. Date.
    - c. Name and address of the Architect.
    - d. Name and address of the Contractor.
    - e. Name and address of the subcontractor.
    - f. Name and address of the supplier.
    - g. Name of the manufacturer.
    - h. Number and title of appropriate Specification Section.
    - i. Drawing number and detail references, as appropriate.
  4. Submittal Transmittal: Package each submittal appropriately. Transmit with a transmittal form. The Architect will not accept submittals from sources other than the Contractor.
  5. Transmittal Form: Use AIA Document G810. On the form, record requests for data and deviations from requirements. Include Contractor's certification that information complies with requirements.
- B. Contractor's Construction Schedule: Prepare a horizontal bar-chart-type, contractor's construction schedule. Provide a separate time bar for each activity and a vertical line to identify the first working day of each week. Use the same breakdown of Work indicated in the "Schedule of Values." Indicate estimated completion in 10 percent increments. As Work progresses, mark each bar to indicate actual completion. Refer to 013010 for additional requirements.
1. Submit within 14 days of the date established for "Commencement of the Work."
  2. Prepare the schedule on reproducible media, of width to show data for the entire construction period.

3. Secure performance commitments from parties involved. Coordinate each element with other activities; include minor elements involved in the Work. Show each activity in proper sequence. Indicate sequences necessary for completion of related Work.
  4. Coordinate with the Schedule of Values, list of subcontracts, Submittal Schedule, payment requests, and other schedules.
  5. Indicate completion in advance of Substantial Completion. Indicate Substantial Completion to allow time for the Architect's procedures necessary for certification of Substantial Completion.
  6. Phasing: Show how phased completion affects the Work.
  7. Indicate critical paths and float periods.
  8. Work Stages: Indicate important stages for each portion of the Work.
  9. Area Separations: Provide a separate time bar to identify each construction area for each portion of the Work. Indicate where each element must be sequenced with other activities.
- C. Shop Drawings: Submit newly prepared information drawn to scale. Indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information. Include the following information:
1. Dimensions.
  2. Identification of products and materials included by sheet and detail number.
  3. Compliance with standards.
  4. Notation of coordination requirements.
  5. Notation of dimensions established by field measurement.
  6. Sheet Size: Except for templates and full-size Drawings, submit one correctable, reproducible print and one blue- or black-line print on sheets at least 8-1/2 by 11 inches but no larger than 36 by 48 inches.
    - a. Do not use Shop Drawings without an appropriate final stamp indicating action taken.
- E. Product Data: Collect Product Data into a single submittal for each element of construction. Mark each copy to show applicable choices and options. Where Product Data includes information on several products, mark copies to indicate applicable information.
1. 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.
  2. Submittals: Submit an electronic (email) copy. Fax copy submittals will not be accepted. Submit hard copies only where electronic copies will not convey needed information (colors, textures, etc.) The Architect will review and distribute marked submittals via email.
    - a. Unless noncompliance with Contract Documents is observed, the submittal serves as the final submittal.

3. Distribution: Furnish copies to installers, subcontractors, suppliers, and others required for performance of construction activities. Show distribution on transmittal forms. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
  - a. Do not use unmarked Product Data for construction.
- F. Samples: Submit full-size Samples cured and finished as specified and identical with the material proposed. Mount Samples to facilitate review of qualities.
  1. Include the following:
    - a. Specification Section number and reference.
    - b. Generic description of the Sample.
    - c. Sample source.
    - d. Product name or name of the manufacturer.
    - e. Compliance with recognized standards.
    - f. Availability and delivery time.
  2. Submit Samples for review of size, kind, color, pattern, and texture, for a check of these characteristics, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed. Where variations are inherent in the material, submit at least 3 units that show limits of the variations.
    - a. Refer to other Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar characteristics.
    - b. Refer to other Sections for Samples to be incorporated in the Work. Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
    - c. Samples not incorporated into the Work, or designated as the Owner's property, are the Contractor's property and shall be removed from the site.
  3. Preliminary Submittals: Submit a full set of choices where Samples are submitted for selection of color, pattern, texture, or similar characteristics from standard choices. The Architect will review and return submittals indicating selection and other action.
  4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit 1 set. Maintain set of Samples, at the Project Site, for quality comparison.
    - a. Unless noncompliance with Contract Documents is observed, the submittal may serve as the final submittal.
    - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
  5. Distribution of Samples: Distribute additional sets to subcontractors, manufacturers, and others as required for performance of the Work. Show distribution on transmittal forms.

- G. Architect's Action: Except for submittals for the record or information, where action and return are required, the Architect will review each submittal, mark to indicate action taken, and return. Compliance with specified characteristics is the Contractor's responsibility.

- 1. Action Stamp: The Architect will stamp each submittal with an action stamp. The Architect will mark the stamp appropriately to indicate the action taken.

1.2 PRODUCTS (Not Applicable)

1.3 EXECUTION (Not Applicable)

END OF SECTION 013000

## SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General Project coordination procedures.
  - 2. Coordination Drawings.
  - 3. Project meetings.

#### 1.2 COORDINATION

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
  - 1. 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.
  - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required 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 Contractor's 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.

### 1.3 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
  - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  - 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 3 days of the meeting.
- B. Pre-construction Conference: Schedule a pre-construction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
  - 1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; 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:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing.
    - d. Designation of responsible personnel.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for processing Applications for Payment.
    - g. Distribution of the Contract Documents.
    - h. Submittal procedures.
    - i. Preparation of Record Documents.
    - j. Use of the premises.
    - k. Responsibility for temporary facilities and controls.
    - l. Parking availability.
    - m. Office, work, and storage areas.
    - n. Equipment deliveries and priorities.
    - o. First aid.
    - p. Security.
    - q. Progress cleaning.
    - r. Working hours.
- C. Progress Meetings: Conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.
  - 1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.



- a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
  - b. Review present and future needs of each entity present, including the following:
    - 1) Interface requirements.
    - 2) Sequence of operations.
    - 3) Status of submittals.
    - 4) Deliveries.
    - 5) Off-site fabrication.
    - 6) Access.
    - 7) Site utilization.
    - 8) Temporary facilities and controls.
    - 9) Work hours.
    - 10) Hazards and risks.
    - 11) Progress cleaning.
    - 12) Quality and work standards.
    - 13) Change Orders.
    - 14) Documentation of information for payment requests.
3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
    - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

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## SECTION 014200 - REFERENCE STANDARDS AND DEFINITIONS

### 1.1 GENERAL

- A. Definitions: Basic contract definitions are included in the Conditions of the Contract.
- B. "Indicated" refers to graphic representations, notes, or schedules on the Drawings; or to other paragraphs or schedules in the Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference. Location is not limited.
- C. "Directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Architect, requested by the Architect, and similar phrases.
- D. "Approved," when used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.
- E. "Regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Provide" means to furnish and install, complete and ready for the intended use.
- G. "Installer" is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
  - 1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
  - 2. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter."
- H. "Project site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- I. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.
- J. Specification Format: These Specifications are organized into Divisions and Sections based on the 48-division format and CSI/CSC's "MasterFormat" numbering system.

- K. Specification Content: These Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Abbreviated Language: Language used in the Specifications is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
  - 2. Streamlined language is generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.
    - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
- L. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- M. Publication Dates: Comply with the standards in effect as of the date of the Contract Documents.
- N. Copies of Standards: Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source and make them available on request.
- O. Abbreviations and Names: Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-producing organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Section 01070, or Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the U.S.," which are available in most libraries.
- P. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.2 PRODUCTS (Not Applicable)

1.3 EXECUTION (Not Applicable)

END OF SECTION 014200

## SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. See Divisions 2 through 26 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.

#### 1.2 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

#### 1.3 USE CHARGES

- A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.
- B. Water and Sewerage Service: Water and sewer utilities are to be extended into the site under this construction contract. Contractor may use such utilities as they become available. Cost for use shall be paid by the contractor.
- C. Electric Power Service: Electrical power for the project is to be extended to the site by Duke Energy and coordinated by the contractor under this contract. Contractor shall be responsible to setting and paying for all temporary power required for construction.

#### 1.4 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

## 1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top rails.
- B. Portable Chain-Link Fencing: Minimum 2-inch, 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide bases for supporting posts.
- C. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry."
- D. Gypsum Board: Minimum 1/2 inch thick by 48 inches wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36/C 36M.
- E. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

### 2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. Heating Equipment: Provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
  - 3. Existing, functional HVAC equipment may be used for temporary heat. New HVAC equipment may not be used for heat until all dust-generating cutting and patching work is complete and ducts are cleaned.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Use of new water service facilities will be permitted. All costs for temporary service, meter hydrants, or other means shall be the responsibility of the contractor.
  - 1. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Heating: Provide temporary heating to maintain building temperature of no less than 60-deg. F and as required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Contractor shall be responsible for providing all temporary power for this project.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

### 3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- D. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.
- E. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
  1. Prohibit smoking in hazardous fire-exposure areas.
  2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  4. Provide "Fire Watches" if required by local AHJ at no additional cost to the Owner.

END OF SECTION 015000



## SECTION 017700 - CONTRACT CLOSEOUT

### 1.1 GENERAL

- A. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 49.
- B. Substantial Completion of all work at the development. Before requesting inspection for certification of Substantial Completion, complete the following:
  - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the Work claimed as substantially complete.
    - a. Include supporting documentation for completion and an accounting of changes to the Contract Sum.
  - 2. Advise the Owner of pending insurance changeover requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
  - 4. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
  - 5. Deliver tools, spare parts, extra stock, and similar items.
  - 6. Changeover locks and transmit keys to the Owner.
  - 7. Complete startup testing of systems and instruction of operation and maintenance personnel. Remove temporary facilities, mockups, construction tools, and similar elements.
  - 8. Complete final cleanup requirements, including touchup painting.
  - 9. Touch up and repair and restore marred, exposed finishes.
- C. Final Acceptance: Before requesting inspection for certification of final acceptance and final payment, complete the following:
  - 1. Final payment request with releases and supporting documentation. Include insurance certificates where required.
  - 2. Submit a statement, accounting for changes to the Contract Sum.
  - 3. Submit a copy of the final inspection list stating that each item has been completed or otherwise resolved for acceptance.
  - 4. Submit consent of surety to final payment.
  - 5. Submit a final settlement statement.
- D. Record Document Submittals: Do not use record documents for construction. Protect from loss in a secure location. Provide access to record documents for the Architect's reference.
- E. Record Drawings: Maintain a set of prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as

originally shown. Mark the drawing most capable of showing conditions fully and accurately. Give attention to concealed elements.

1. Mark sets with red pencil. Use other colors to distinguish between variations in separate categories of the Work.
  2. Organize record drawing sheets into manageable sets. Bind with durable-paper cover sheets; print titles, dates, and other identification on the cover of each set.
- F. Record Specifications: Maintain one copy of the Project Manual, including addenda. Mark to show variations in Work performed in comparison with the text of the Specifications and modifications. Give attention to substitutions and selection of options and information on concealed construction. Note related record drawing information and Product Data.
1. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.
- G. Maintenance Manuals: Provide 1 Maintenance Manual in hard copy. Also, provide a digital (scanned) copy. Organize operation and maintenance data into sets of manageable size. Bind in individual, heavy-duty, 2-inch, 3-ring, binders, with pocket folders for folded sheet information. Mark identification on front and spine of each binder. Include the following information:
1. Emergency instructions.
  2. Spare parts list.
  3. Copies of warranties.
  4. Wiring diagrams.
  5. Shop Drawings and Product Data.
- 1.2 PRODUCTS (Not Applicable)
- 1.3 EXECUTION
- A. Operation and Maintenance (O&M) Instructions: Provide 1 O&M Manual in hard copy. Also, provide a digital (scanned) copy. Arrange for each Installer of equipment that requires maintenance to provide documentation and instruction in proper operation and maintenance. Include a detailed description and review of the following items:
1. Maintenance manuals.
  2. Spare parts, tools, and materials.
  3. Lubricants and fuels.
  4. Identification systems.
  5. Control sequences.
  6. Hazards.
  7. Warranties and bonds.
  8. Maintenance agreements and similar continuing commitments.
- B. As part of instruction for operating equipment, demonstrate the following:
1. Startup and shutdown.
  2. Emergency operations and safety procedures.
  3. Noise and vibration adjustments.

- C. Final Cleaning: Employ experienced cleaners for final cleaning. Clean each surface or unit provided under this contract, to the condition expected in a normal, commercial building cleaning and maintenance program. Complete the following operations before requesting inspection for certification of Substantial Completion.
  - 1. Remove labels that are not permanent labels.
  - 2. Clean transparent materials, including mirrors and glass. Remove glazing compounds. Replace chipped or broken glass.
  - 3. Clean exposed finishes to a dust-free condition, free of stains, films, and foreign substances. Leave concrete floors broom clean. Vacuum carpeted surfaces.
  - 4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication. Clean plumbing fixtures. Clean light fixtures and lamps.
  - 5. Make unit completely ready for occupancy. The unit shall be in move-in conditions upon turnover to the Owner.
  - 6. Removal of Protection: Remove temporary protection and facilities.
- E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Remove waste materials and dispose of lawfully.

END OF SECTION 017700

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SECTION 018113  
Veterans Village  
SUSTAINABLE DESIGN REQUIREMENTS

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. LEED Certification requirements
- B. The intent of this project is to achieve a **Silver- level** LEED certification under the **LEED BD+C Homes and Multifamily Low-rise** rating system.
- C. Contractor shall coordinate work and requirements with Owner Contracted LEED Homes verification team comprising **LEED Provider and Green Rater**. Pertinent to LEED certifications the role of the verification team 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. Bay Area Air Quality Management District: BAAQMD Regulation 8, Rule 51 –
- D. Adhesive and Sealant Products. Carpet and Rug Institute: CRI Green Label Testing Program.
- E. Forest Stewardship Council: FSC Guidelines- Forest Stewardship Council Guidelines.
- F. Green Seal: GS-11 - Product Specific Environmental Requirements.
- G. California Department of Public Health Standard Method V1.1–2010, using CA Section 01350, Appendix B.
- H. Sheet Metal and Air Conditioning Contractors: SMACNA IAQ - IAQ Guidelines for Occupied Buildings under Construction.
- I. South Coast Air Quality Management District: SCAQMD Rule 1168 - Adhesive and Sealant Applications.

- J. U.S. Environmental Protection Agency:
  - 1. EPA 832-R-92-005 - Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
  - 2. EPA Baseline IAQ - Testing for Indoor Air Quality, Baseline IAQ, and Materials Section 01445
  - 3. EPA 402-K-01-002 – A Step-by-Step Guide on how to Build Radon-Resistant Homes
- K. U.S. Green Building Council:
  - 1. LEED Version 4 - Reference Guide for Homes Design & Construction
- L. ENERGY STAR Qualified Homes
  - 1. Energy Star National Rater Design Review Checklist
  - 2. Energy Star National Rater Field Checklist
  - 3. Energy Star National HVAC Design Report
  - 4. Energy Star National HVAC Commissioning Checklist
  - 5. Energy Star Water Management System Builder Checklist

#### SUBMITTALS

- A. The contractor shall submit the following items directly to the Green Rater.
  - 1. Attendee list of On-site LEED Trades Training meeting moderated by LEED Verification Team (LEED Green Rater and/or Provider-QAD)
  - 2. Energy Star Water Management System Builder Checklist signed and initialed by General Contractor.
- B. Energy Star HVAC System Quality Installation Contractor Checklist signed and initialed by HVAC Contractor credentialed by an EPA-recognized HVAC Quality Installation Training and Oversight Organization (H-QUITO)
  - 1. If tropical wood is used – Provide invoices for FSC certified wood with Chain of Custody Certificate number.
  - 2. Construction Waste Volume or Weight and Diversion Rate (Calculation and Waste Hauling Tickets)
  - 3. Provide documentation of dates and times of preoccupancy flush schedule to Green Rater.
- C. Signed LEED Accountability Form certifying that all products meet or exceed the specified requirements and the requirements of LEED, as noted with "LEED". Submit this information as part of the product submittals.
- D. The contractor shall submit cut-sheets of products intended to comply with Environmentally Preferable Products (EPP). See LEED checklist for list of products intended to meet this requirement. EPP criteria are as follows:
  - 1. Recycled Content Requirement:
    - a. Minimum 25% post-consumer or 50% post-industrial. OR
    - b. The product contains at least 25% reclaimed material, including salvaged, refurbished, or reused materials.
    - c. Bio-based materials. Bio-based products must meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Bio-based raw materials must be tested using ASTM Test Method D6866 and be legally harvested, as defined by the exporting and receiving country.
    - d. Concrete that consists of at least 30% fly ash or slag used as a cement substitute and 50% recycled content or reclaimed aggregate OR 90% recycled content or reclaimed aggregate.
  - 2. Low Emissions Requirement– See specific requirements for Low-VOC paints, Adhesives and Sealants at end of this section.
  - 3. Local Production Requirement – Extracted, manufactured, and fabricated (all processes) within a 100-mile crow-fly distance of site.

## QUALITY ASSURANCE

1. Perform work in accordance with the **LEED Version 4 - Reference Guide for Homes Design & Construction** for prerequisites and credits pertinent to this project listed in LEED Checklist included at the end of this section.
- A. Maintain one copy of LEED for Homes Rating System document on site. Download at <https://www.usgbc.org/resources/leed-v4-homes-and-multifamily-midrise-current-version>
  - B. Perform inspections to assure conformance to Energy Star Qualified Homes Checklists throughout construction of the project. A copy of all pertinent Energy Star Inspection Checklists is enclosed at end of this section.
  - C. Monitor closely any requests for substitution for products that are related to LEED prerequisites and credits. Unless reviewed thoroughly 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 and local energy code, whichever is more stringent.
  - 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 system is operated during heavy construction, furnish disposable temporary filters.
    4. Pre-Occupancy Flush: Flush the entire building with fresh air for a total of 48 hours after all construction is complete. Run continuous fans through the duration of the flush. Replace all HVAC filters upon completion.

## PART 2 – PRODUCTS

### PRODUCT SUBSTITUTION

- A. Monitor closely any requests for substitution for products that are related to LEED prerequisites and credits. Unless reviewed thoroughly substitutions may jeopardize projects' ability to obtain certification.

## PART 3 - EXECUTION

LEED PREREQUISITES AND CREDITS (See enclosed LEED Checklist for more information)

### INTEGRATIVE PROCESS

#### **A. IP Credit 1.3 (option 3) – Trades Training**

1. At the onset of construction organize a LEED trades training moderated by LEED Green Rater and/or Provider-QAD.
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 LEED Green Rater prior to training date.

### SUSTAINABLE SITES

#### **A. SS Prerequisite 1 - Construction Activity Pollution Prevention**

1. Stockpile and protect disturbed topsoil from erosion (for reuse).
2. Control the path and velocity of runoff with silt fencing or comparable measures.
3. Protect on-site storm sewer inlets, streams, and lakes with straw bales, silt fencing, silt sacks, rock filters, or comparable measures.
4. Provide swales to divert surface water from hillsides.
5. Use tiers, erosion blankets, compost blankets, filter socks, berms, or comparable measures to stabilize soils in any area with a slope of 15% (6.6:1) or more that is disturbed during construction.
6. Prevent air pollution from dust and particulate matter.
7. Construction sites larger than 1 acre must conform to the erosion and sedimentation requirements of the 2012 U.S. Environmental Protection Agency Construction General Permit or local equivalent, whichever are more stringent.

#### **B. SS Prerequisite 2 - No Invasive Plants**

1. Coordinate with Landscape Contractor to ensure no invasive plant species are introduced into landscape.

#### **C. SS Credit 2 – Rainwater Management**

1. Case 1 - Implement low-impact development (LID) techniques to minimize the amount of stormwater that leaves the site as indicated on civil and landscape plans. Features to include a combination of following:
  - a. Planting areas with native or adapted plant material (e.g. trees shrubs);
  - b. installing a vegetated roof;
  - c. using permeable paving, consisting of porous above-ground materials (e.g., open pavers, engineered products), a base layer designed to drain water away from the home, and (often) a 6-inch-deep subbase; and
  - d. installing permanent infiltration or collection features (e.g., vegetated swale, rain garden, rainwater cistern) that can handle 100% of the runoff from a two-year, 24-hour storm.

#### **D. SS Credit 3 – Non-toxic Pest Control**

1. Design a minimum 6-inch inspection space between the surface of the planned landscape grade and non-masonry siding.
2. Seal all external cracks, joints, penetrations, edges, and entry points with appropriate caulking. Install rodent and corrosion-proof screens (e.g., copper or stainless-steel mesh) on all openings greater than 1/4 inch, except where code prohibits their installation (e.g., dryer vents).
3. Design discharge points for rain gutters, air-conditioning condensation lines, steam vent lines, or any other moisture source such that discharge is at least 24 inches from the foundation.



4. Multifamily building projects **must** develop an integrated pest management policy that includes guidance for residents on pesticide use, housekeeping, and prompt reporting of pest problems; incorporate the policy in the Homeowner Education Manual.

## WATER EFFICIENCY

### A. WE Prerequisite 1 – Water Metering

1. Multifamily: Install a water meter for each building.

### B. WE Credit 2 – Indoor Water Use

Provide product data showing flow rates for following fixtures:

1. Average flow rate of lavatory faucets shall be 1.20 gallons per minute or less. Each lavatory faucet or faucet aerator must be WaterSense labeled.
2. Average flow rate of showers shall be 1.50 gallons per minute or less. Each showerhead fixture and fitting must be WaterSense labeled.
3. Each clothes washer must be ENERGY STAR qualified.

## ENERGY & ATMOSPHERE

### A. EA Prerequisite 1– Minimize Energy Performance (Single-Family and Multifamily Low-rise)

1. Meet the requirements of ENERGY STAR for Homes, version 3.
2. Complete the thermal enclosure system rater checklist, the HVAC system quality installation rater and contractor checklists, and the water management system builder checklist. Certified Passive House projects automatically meet the thermal enclosure system rater checklist requirement. Achieve a HERS index rating at or below the HERS index target or meet the requirements of the ENERGY STAR for Homes version 3.
3. At least one of the following appliances must be ENERGY STAR qualified and installed in each dwelling unit: refrigerator; OR dishwasher; OR clothes washer.
4. All duct runs must be fully ducted (i.e., building cavities may not be used as ducts).
5. Minimum envelope leakage –  
following areas of building envelope and demising walls shall be sealed, caulked, gasketed, or weather-stripped to minimize envelope leakage:
  - a. Joints around windows and doors.
  - b. Joints between walls and foundation; between conditioned spaces and attics, demising walls, crawl spaces or garage.
  - c. Seal joints between sill plate and drywall.
  - d. Seal joints between top plate and drywall.
  - e. All mechanical, plumbing, and electrical penetrations in exterior and demising walls. Mechanical chase shall be sealed at crawl space ceiling.
  - f. Exterior sheathing and house wrap.
  - g. Minimize entry of air from outdoors, attic, garage, and crawl space into exterior wall and interior wall cavities to ensure passing of air infiltration test.
  - h. 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.
6. Thermal Bypass Inspection -  
The Green Rater will conduct a visual Thermal Bypass Inspection to inspect proper installation and continuity of thermal insulation and air-tightness of envelope. This inspection must take place after exterior envelope insulation has been installed, but prior to and installation of any drywall. One inspection per floor shall be conducted. If additional inspections are deemed necessary due construction sequencing, Contractor shall notify the Architect and Green Rater immediately. Contractor shall schedule the inspection with no less than a two-week notice to the Green Rater. 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. A sample Thermal Bypass Inspection Checklist is enclosed in section 018113.

7. **Final Inspections -**  
Upon substantial completion and prior to occupancy, the Green Rater 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.
8. **Third-Party Testing -**  
Third-party Testing is to be scheduled and conducted in conjunction with the final inspection. 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. The following tests shall be conducted by Green Rater:
  - a. Air Infiltration Test (Blower door Test) – Mandatory – Measures air leakage through unit enclosure such as exterior walls, demising walls, ceilings, chases, etc.
  - b. Distribution Loss Test (Duct Blaster Test) – Mandatory – Measures leakage through the mechanical distribution system
  - c. Exhaust Test - Measures exhaust rate for bathroom fans and kitchen fans.
  - d. Flow Test and Balancing – Measure air flow at each supply register and pressure differential between rooms.

## **B. EA Prerequisite 2 – Energy Metering**

For Multifamily Buildings

1. Install an electricity meter or submeter for each residential unit and a gas meter for the entire building, or a gas meter or sub-meter for each unit. Single room–occupancy units, transitional and temporary housing, and designated supportive housing buildings do not need an energy meter in each unit but must have a whole-building energy meter.

## **C. EA Prerequisite 3 – Education of the Homeowner, Tenant, or Building Manager**

1. General Contractor to provide to Owner or Owner's Building Management an operations and maintenance manual, binder, or CD that includes all the following items:
  - a. the completed checklist of LEED-related features;
  - b. a copy of each signed accountability form;
  - c. copies of all ENERGY STAR for Home, version 3, checklists;
  - d. product manufacturers' manuals for all installed equipment, fixtures, and appliances;
  - e. general information on efficient use of energy, water, and natural resources;
  - f. operations and maintenance guidance for any installed equipment, including space heating and cooling, mechanical ventilation, humidity control, radon protection, renewable energy, and irrigation, rainwater harvesting, or graywater systems (following 2009 EPA WaterSense Single-Family New Home Specifications, item 5.0, Homeowner Education);
2. LEED Green Rater to assist with following items for inclusion in manuals:
  - a. guidance on occupants' activities and choices, including cleaning materials and methods, water-efficient landscaping, integrated pest management, effects of chemical fertilizers and pesticides, irrigation, lighting selection, and appliance selection;
  - b. information on local green power options; and
  - c. information on sharing utility data with USGBC via a USGBC-approved third party.
3. General Contractor to conduct a minimum one-hour walkthrough of the home with Owner and/or building manager. The walkthrough must feature the following:
  - a. identification of all installed equipment;
  - b. instruction in how to use and operate the equipment; and
  - c. information on its maintenance.

## **D. EA Credit 2 – Efficient Hot Water Distribution System**

1. Option1 - Path1 - Maximum Allowable Pipe Length:

- a. Total linear hot water pipe length not to exceed 21 feet or 3/4" dia.; 32 feet for 5/8" dia.; 42 feet for 1/2" dia.; and 50 feet for 3/8" dia.
- b. Length requirements do not apply to cold water demand loads for following fixtures – toilets, tubs without showerheads, or stovetop pot-fillers.
- c. For projects using circulating systems, meet all the following:
  - i. Circulating pump does not operate continuously, is on a timer, or is on a water temperature sensor.
  - ii. Circulating pump is demand activated by a momentary contact switch, motion sensor, flow switch, door switch or voice command.
  - iii. After the pump starts, the controls allow the pump to operate until the water temperature in the return pipe rises not more than 10°F (6 °C) above the initial temperature of the water in the pipe. Controls limit the water temperature to a maximum of 105°F (40 °C). Controls limit pump operation to not more than 5 minutes per activation in the event that both means of shutting off the pump have failed.
  - iv. Circulating hot water systems have with an automatic or readily accessible manual switch to turn off the hot water circulating pump when not in use.

**E. EA Credit 5 – HVAC Start-Up Credentialing**

1. Have all heating, cooling, and ventilation systems commissioned by a technician with North American Technician Excellence certification, HVAC contractor credentialed by an EPA-recognized HVAC Quality Installation Training and Oversight Organization (H-QUITO) (or equivalent as defined by USGBC). The technician must complete the ENERGY STAR for Homes, version 3, HVAC system quality installation contractor checklist or equivalent as defined by USGBC.

**MATERIALS & RESOURCES**

**A. MR Prerequisite 1 – Certified Tropical Wood**

1. All wood in the building must be non-tropical, reused or reclaimed, or certified by the Forest Stewardship Council, or USGBC-approved equivalent.
2. If tropical wood is used it must be FSC Certified. Provide vendor's chain-of-custody certificate number must be shown on any invoice that includes FSC-certified products.

**B. MR Prerequisite 2 – Durability Management**

1. Meet the requirements of the ENERGY STAR for Homes, version 3, water management system builder checklist attached at end of this section.
2. Install all the applicable indoor moisture control measures:
  - a. Area directly above bathtub, spa, or shower (extending to ceiling), exposed wall or area behind fiberglass enclosure if wallboard is installed - Use non-paper-faced backer board or paper-faced product or coating over wallboard that meets standard ASTM D 3273 standard
  - b. Kitchen, bathroom, laundry room, spa area - Use water-resistant flooring; do not install carpet.
  - c. Install water resistant flooring (not carpet) within 3 feet of exterior doors accessible from ground.
  - d. Tank water heater in or over living space - Install drain and drain pan, drain pan and automatic water shut-off or flow restrictor, or floor drain with floor sloped to drain.
  - e. Clothes washer (or condensing clothes dryer) in or over living space - Install drain and drain pan, drain pan and automatic water shut-off or flow restrictor, floor drain with floor sloped to drain, or braided washer hose.
  - f. Conventional clothes dryer - Exhaust directly to outdoors

**C. MR Credit 1 – Durability Management Verification**

1. LEED verification team (Green Rater) to inspect and verify each measure listed in the ENERGY STAR for Homes, version 3, water management system builder checklist.

2. Allow Green Rater access to the premise to inspect items in ENERGY STAR for Homes, version 3, water management system builder checklist.

**D. MR Credit 2 – Environmentally Preferable Products**

1. Option 1 - Local Production - Use products that were extracted, processed, and manufactured locally within 100 miles of site and for the following components (at least 50% of the component). Contractor to provide documentation proving compliance with Environmentally Preferable Product requirements for the following products:
  - a. Aggregate for concrete and foundation
2. Option 2 – Environmentally Preferable Products –Use products that contain at least 25% **postconsumer** or 50% **preconsumer** content. Use synthetic gypsum board products that contain at least 95% recycled content and non-synthetic gypsum board products that contain at least 10% post-consumer recycled content. Contractor to provide documentation proving compliance with Environmentally Preferable Product requirements for the following products:
  - a. Floor covering
  - b. Insulation
  - c. Drywall, Interior Finish

**E. MR Credit 4 – Material Efficient Framing**

1. Implement any of the following advanced framing techniques for at least 90% of each component.
  - a. Size headers for actual loads.
  - b. Use ladder blocking or drywall clips.
  - c. Space roof rafters greater than 16 inches o.c.

**INDOOR ENVIRONMENTAL QUALITY**

**Multifamily**

1. Local Exhaust
  - a. Design and install local exhaust systems in all bathrooms (including half-baths) and the kitchen to meet the requirements of ASHRAE Standard 62.2–2010, Sections 5 and 7 or local equivalent, whichever is more stringent. Provide minimum intermittent local exhaust flow rates of 100 cfm or 5ACH in kitchen, and 50 cfm in bathrooms.
  - b. Exhaust air to the outdoors. Do not route exhaust ducts to terminate in attics or interstitial spaces. Just recirculating range hoods or recirculating over-the-range microwaves do not satisfy the kitchen exhaust requirements.
  - c. Use ENERGY STAR–labeled bathroom exhaust fans in all bathrooms.
  - d. For exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (188 liters per second), provide makeup air at a rate approximately equal to the exhaust air rate. Makeup air systems must have a means of closure and be automatically controlled to start and operate simultaneously with the exhaust system.
2. Ventilation
  - a. Fresh air ventilation to dwelling units shall comply with ventilation requirements of ASHRAE 62.2–2010.
  - b. Do not use systems that rely on transfer air from pressurized hallways or corridors, adjacent dwelling units, attics, etc.
  - c. Project teams using exhaust-only ventilation systems must comply with flow rate required by ASHRAE 62.2–2010. If bathroom exhaust fan is used for exhaust-only fresh-air ventilation, then refer to HVAC drawings for exhaust fan run-time and controls. Coordinate continuous / intermittent fan run-time and controls with HVAC and Electrical contractor. Provide dual-speed bathroom exhaust fan with continuous speed set to 30 cfm in 1-Bedroom units, 45 cfm in 2-Bedroom units, and 45 cfm in 3-Bedroom units. **OR** provide intermittent bathroom exhaust fan with 80 cfm equipped with a ventilation timer set to run 23 minutes per hour for 1 bedroom, or 34 minutes per hour for 2 bedrooms.

- d. Continuous in-unit ventilation fans must be rated for sound at a maximum of 1.0 sone, per ASHRAE 62.2–2010, Section 7.2.1. Remote mounted fans need not meet these sound requirements.
- e. Locate air inlets that are part of the ventilation design at least 10 feet (3 meters) from known sources of contamination, such as a stack, vent, exhaust hood, or vehicle exhaust. Place the intake such that entering air is not obstructed by snow, plantings, or other material. Forced air inlets must be covered by screens to exclude rodents and insects (mesh not larger than 1/2 inch or 13 millimeters).
- 3. For all non-unit spaces, meet the minimum requirements of ASHRAE Standard 62.1–2010 or local equivalent, whichever is more stringent, Sections 4–7, Ventilation for Acceptable Indoor Air Quality (with errata). Mechanically ventilated spaces must be designed using the ventilation rate procedure or the applicable local code, whichever is more stringent. Ventilation fans that penetrate rated assemblies may require radiation and fire dampers to meet local building and fire codes.

#### **A. EQ Prerequisite 2 – Combustion Venting**

- 1. Do not install any unvented combustion appliances (ovens and ranges excluded).
- 2. Install a carbon monoxide (CO) monitor on each floor, hard-wired with a battery backup. In multifamily buildings, install a CO monitor on each floor of each unit.
- 3. For all fireplaces and woodstoves inside the building, provide doors that close or a solid glass enclosure. Interior fireplaces and woodstoves that are not closed-combustion or power-vented must pass BPI or RESNET combustion safety testing protocols to ensure that depressurization of the combustion appliance zone is less than 5 Pa.
- 4. Space- and water-heating equipment that involves combustion must meet one of the following:
  - a. it must be designed and installed with closed combustion (i.e., sealed supply air and exhaust ducting);
  - b. it must be designed and installed with power-vented exhaust; or
  - c. it must be located in a detached utility building or open-air facility.

#### **B. EQ Prerequisite 3 – Garage Pollutant Protection**

- 1. Place all air-handling equipment and ductwork outside the fire-rated envelope of the garage.
- 2. Tightly seal shared surfaces between the garage and conditioned spaces, including all of the following:
  - a. In conditioned spaces above the garage, seal all penetrations and all connecting floor and ceiling joist bays.
  - b. In conditioned spaces next to the garage, weather-strip all doors, install carbon monoxide detectors in rooms that share a door with the garage, seal all penetrations, and seal all cracks at the base of the walls.

#### **C. EQ Prerequisite 4 – Radon-Resistant Construction**

##### **New Construction**

- 1. Provide a Passive or Active Radon Mitigation System per following requirements:
  - a. Install polyethylene sheeting or extruded polystyrene (XPS) insulation beneath concrete slabs, including basement floors. Ensure sheeting is in direct contact with the concrete slab above. Install a capillary break at all crawlspace floors using ≥ 6 mil polyethylene sheeting, lapped 6 to 12 in.
  - b. Under the polyethylene sheeting or extruded polystyrene (XPS) insulation installed to meet ENERGY STAR Water Management System Builder Checklist Item 1.3:
    - i. Install a 4 in. layer of 1/2 in. diameter or greater clean aggregate; OR
    - ii. Install a 4 in. uniform layer of sand, overlain with either a layer of geotextile drainage matting throughout or strips of geotextile drainage matting along the perimeter installed according to the manufacturer's instructions.
  - c. A 3 or 4 in. diameter gas-tight vertical vent pipe, clearly labeled to conform with the radon-resistant standard used, e.g., "Radon Reduction System" or "Radon Pipe" or

“Radon System.” The vent pipe shall be connected to an open T-fitting in the aggregate layer (or connected to geotextile drainage matting according to the manufacturer’s instructions) beneath the polyethylene sheeting, extending up through the conditioned spaces and terminating a minimum of 12 in. above the roof opening. For crawlspaces, install at least 5 ft. of horizontal perforated drain tile on either side of the T-fitting, attached to the vertical radon vent pipe beneath the sheeting and running parallel to the long dimension of the house.

- d. Radon fan installed in the attic (i.e., an active system) OR an electrical receptacle installed in an accessible attic location near the radon vent pipe (i.e., a passive system) to facilitate future fan installation if needed.
2. The requirements for radon protection are automatically satisfied if the building is elevated by at least 2 feet (600 millimeters), with open air space between the building and ground. An enclosed vented crawlspace does not qualify. A garage under a building is an acceptable alternative.
3. Foundation air sealing with polyurethane caulk or the equivalent at all slab openings, penetrations and control or expansion joints.

#### **D. EQ Prerequisite 5 – Air Filtering**

1. Install air filters with a minimum efficiency reporting value (MERV) of 8 or higher on all recirculating space conditioning systems, per ASHRAE 62.2–2010. Design ductwork and specify the central blower to account for the pressure drop across the filter. Air filter housings must be airtight to prevent bypass or leakage.
2. Non-ducted systems are exempt from the minimum MERV 8 requirements but must have an internal air filter in the air-handling unit.
3. Install air filters rated MERV 6 or higher for mechanically supplied outdoor air for systems with 10 feet (3 meters) of ductwork or more, per ASHRAE 62.2–2010, Section 6.7.

#### **E. EQ Prerequisite 6 – Environmental Tobacco Smoke**

Multifamily

1. Provide signage to:
  - a. prohibit smoking in common areas,
  - b. prohibit smoking within 25 feet of building entrances.
  - c. or prohibit smoking on the entire property.

#### **F. EQ Prerequisite 7 – Compartmentalization**

1. Compartmentalize each residential unit to minimize leakage between units. Minimize uncontrolled pathways for environmental tobacco smoke and other indoor air pollutants between units by sealing penetrations in walls, ceilings, and floors and by sealing vertical chases (including utility chases, garbage chutes, mail drops, and elevator shafts) adjacent to the units.
2. Weather-strip all doors in the residential units leading to common hallways to minimize air leakage into the hallway. Weather-strip all exterior doors and operable windows to minimize leakage from outdoors.
3. Demonstrate acceptable sealing of residential units by a blower door test. Follow the procedure described by RESNET or the ENERGY STAR Multifamily High Rise Program Testing and Verification Protocols, Version 1.0, with an allowable maximum leakage of 0.30 cfm<sub>50</sub> per square foot (0.07 cmm<sub>50</sub> per square meter) of enclosure (i.e., all surfaces enclosing the apartment, including exterior and party walls, floors, and ceiling) for new construction buildings.
4. Third-party Testing is to be scheduled and conducted in conjunction with the final inspection. 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. The following tests shall be conducted by Green Rater:
  - a. Air Infiltration Test (Blower door Test) – Mandatory – Measures air leakage through unit enclosure.

**G. EQ Credit 1.1 (option 1) – Enhanced Ventilation - Enhanced Local Exhaust**

1. Use one of the following strategies in every bathroom with a shower, bathtub, or spa (i.e., half-baths are exempt) to control the use of the local exhaust fan:
  - a. an occupancy sensor;
  - b. an automatic humidistat controller;
  - c. a continuously operating exhaust fan; or
  - d. a delay timer that operates the fan for at least 20 minutes

**H. EQ Credit 2.3 (option 3) – Contaminant Control - Preoccupancy Flush**

1. At installation, seal all permanent ducts and vents to minimize contamination from construction. Remove seals after all phases of construction are completed. After construction ends and before occupancy, flush the home with fresh air, according to the following guidelines:
  - a. Remove any dust and debris from ducts.
  - b. Flush the entire home for 48 hours, keeping all windows and interior doors open; the 48 hours may be nonconsecutive if necessary.
  - c. Keep all windows open and run a fan (e.g., HVAC system fan) continuously, or flush the home with all HVAC fans and exhaust fans operating continuously at the highest flow rate.

**I. EQ Credit 3.1 (option 1) – Balancing of H&C Distribution Systems - Multiple Zones**

1. Install a system with at least two space-conditioning zones with independent thermostatic controls. In houses with both a heating system and a cooling system, each must have at least two zones.
2. Single-family houses with less than 800 square feet (74 square meters) of conditioned floor area and multifamily buildings whose average unit size is less than 1,200 square feet (110 square meters) automatically meet the requirements of this credit.

**J. EQ Credit 3.3 (option 3) – Balancing of H&C Distribution Systems - Pressure Balancing**

1. Facilitate for Green Rater or a Third-Party to test each bedroom for pressure difference of more than 3 Pa (0.012-inch w.c.) with respect to the main body of the house when doors are closed, and the air handler is operating on highest speed.

**K. EQ Credit 7 – Low Emitting Products**

1. In the interior of the home, use products that have been tested and found compliant with the California Department of Public Health Standard Method V1.1–2010, using CA Section 01350, Appendix B, New Single-Family Residence Scenario, for emissions testing guidance. At least 90% of a component must meet the requirements to earn credit.
  - a. For site-applied interior paints and coatings, meet the requirements of CA Section 01350.
  - b. For flooring, meet the requirements of CA Section 01350.

<b>TABLE 1. Acceptable certifications for emissions and content requirements</b>		
<b>CERTIFICATION</b>	<b>TESTING STANDARD REFERENCED IN LEED</b>	<b>APPLICABLE CATEGORIES</b>
SCS Indoor Advantage Gold	CDPH Standard Method v1.1 ANSI/BIFMA M7.1-2011	General Emissions Evaluation (many product categories), Furniture
FloorScore	CDPH Standard Method v1.1	Flooring
Carpet and Rug Institute (CRI) Green Label Plus	CDPH Standard Method v1.1	Carpeting, carpet padding, adhesives
Greenguard Children and Schools	CDPH Standard Method v1.1	General Emissions Evaluation (many product categories including exterior applied products)
Collaborative for High Performance Schools (CHPS)	CDPH Standard Method v1.1	General Emissions Evaluation (many product categories)
CARB ULEF label	N/A	Composite Wood

## ENCLOSURES

### **Low-Rise**

#### **New Construction**



- 1 LEED for Homes Scorecard and Credit Categories
- 2 Energy Star National Rater Design Review Checklist
- 3 Energy Star National Rater Field Checklist
- 4 Energy Star National HVAC Design Report
- 5 Energy Star National HVAC Commissioning Checklist
- 6 Energy Star Water Management System Builder Checklist

END OF SECTION



**Veterans Village Scorecard (ID: )**Project Address **Veterans Village**

Note: The information on this tab is READ-ONLY. To edit this information, see the Credit Category tabs.

Total		Certification Level:		Not Certified		Verified		0	
	Integrative Process		Preliminary	Y	2 of 2	M	0	Verified	0
	IPc	Integrative Process			2 of 2		0		
	Location and Transportation		Preliminary	Y	0 of 15	M	0	Verified	0
	LTp	Floodplain Avoidance			Required				Not Verified
	LTc	LEED for Neighborhood Development			0 of 15		0		
	LTc	Site Selection			0 of 8		0		
	LTc	Compact Development			0 of 3		0		
	LTc	Community Resources			0 of 2		0		
	LTc	Access to Transit			0 of 2		0		
		Sustainable Sites		Preliminary	Y	1.5 of 7	M	2	Verified
SSp		Construction Activity Pollution Prevention			Required				Not Verified
SSp		No Invasive Plants			Required				Not Verified
SSc		Heat Island Reduction			0 of 2		0		
SSc		Rainwater Management			0 of 3		2		
SSc		Nontoxic Pest Control			1.5 of 2		0		
		Water Efficiency		Preliminary	Y	3 of 12	M	1	Verified
	WEp	Water Metering			Required				Not Verified
	WEc	Total Water Use			0 of 12		0		
	WEc	Indoor Water Use			3 of 6		1		
	WEc	Outdoor Water Use			0 of 4		0		
	Energy and Atmosphere		Preliminary	Y	22 of 38	M	5	Verified	0
	EAp	Minimum Energy Performance			Required				Not Verified
	EAp	Energy Metering			Required				Not Verified
	EAp	Education of the Homeowner, Tenant or Building Manager			Required				Not Verified
	EAc	Annual Energy Use			20 of 29		5		
	EAc	Efficient Hot Water Distribution System			2 of 5		0		
	EAc	Advanced Utility Tracking			0 of 2		0		
	EAc	Active Solar-Ready Design			0 of 1		0		
	EAc	HVAC Start-Up Credentialing			0 of 1		0		



Materials and Resources		Preliminary	Y	4.5 of 10	M	3	Verified	0
MRp	Certified Tropical Wood	Required				Not Verified		
MRp	Durability Management	Required				Not Verified		
MRc	Durability Management Verification	1 of 1		0				
MRc	Environmentally Preferable Products	2.5 of 4		1				
MRc	Construction Waste Management	0 of 3		2				
MRc	Material-Efficient Framing	1 of 2		0				



Indoor Environmental Quality		Preliminary	Y	8 of 16	M	1	Verified	0
EQp	Ventilation	Required				Not Verified		
EQp	Combustion Venting	Required				Not Verified		
EQp	Garage Pollutant Protection	Required				Not Verified		
EQp	Radon-Resistant Construction	Required				Not Verified		
EQp	Air Filtering	Required				Not Verified		
EQp	Environmental Tobacco Smoke	Required				Not Verified		
EQp	Compartmentalization	Required				Not Verified		
EQc	Enhanced Ventilation	1 of 3		0				
EQc	Contaminant Control	0 of 2		0.5				
EQc	Balancing of Heating and Cooling Distribution Systems	2 of 3		0				
EQc	Enhanced Compartmentalization	0 of 1		0				
EQc	Enhanced Combustion Venting	2 of 2		0				
EQc	Enhanced Garage Pollutant Protection	2 of 2		0				
EQc	Low-Emitting Products	1 of 3		0.5				



Innovation		Preliminary	Y	2 of 6	M	0	Verified	0
INp	Preliminary Rating	Required				Not Verified		
INc	Innovation	1 of 5		0				
INc	LEED Accredited Professional	1 of 1		0				



Regional Priority		Preliminary	Y	0 of 4	M	1	Verified	0
RPc	Regional Priority	0 of 4		1				

### Point Floors

The project earned at least 8 points total in Location and Transportation and Energy and Atmosphere

No

The project earned at least 3 points in Water Efficiency

No

The project earned at least 3 points in Indoor Environmental Quality

No

### Total

Preliminary Y 43 of 110 M 13 Verified 0

**Certification Thresholds** Certified: 40-49, Silver: 50-59, Gold: 60-79, Platinum: 80-110

## Integrative Process

Preliminary Y 2

Maybe 0

Verified 0

### IP Credit Integrative Process

Up to 2 points

*Exemplary Performance: Achieve all three options*

Preliminary Y

2

M

0

Verified

0

#### Option 1. Integrative Project Team (1 point)

Y

M

V

Team members, in addition to the builder and verification team, include capabilities in at least three of the following skill sets: architecture or residential building design; mechanical or energy engineering; building science or performance testing; green building or sustainable design; and civil engineering, landscape architecture, habitat restoration, or land-use planning.

All team members referenced above were involved in at least three of the following phases of the design and construction process: conceptual or schematic design; LEED planning; preliminary design; energy and envelope systems analysis or design; design development; and construction.

Meetings were conducted with the project team at least monthly to review project status, introduce new team members to project goals, discuss problems, formulate solutions, review responsibilities, and identify next steps.

AND/OR

#### Option 2. Design Charrette (1 point)

Y

1

M

V

True

A full-day workshop (or two half-day workshops) was conducted with the project team, as defined in Option 1, no later than the design development phase.

1/19/2026

Date(s)

Duration

AND/OR

#### Option 3. Trades Training (1 point)

Y

1

M

V

True

At least eight hours of training on the green aspects of the project and how the trades can contribute to achieving each LEED for Homes prerequisite and attempted credit was conducted before construction but after trades have been hired for the project.

Date(s)

Duration

Trainer

## Location and Transportation

Preliminary Y 0

Maybe 0

Verified 0

### LT Prerequisite Floodplain Avoidance

#### Required

Verified

Select one of the following:

True

The project is not built on land within a flood hazard area.

The project is built on land within a flood hazard area and in accordance with flood provisions.

The project is built on land within a flood hazard area and is a previously developed building and hardscape.

### LT Credit LEED for Neighborhood Development

15 points

Preliminary Y

M

Verified

Name of LEED for Neighborhood Development project

LEED ND project ID number

Rating system and version

LEED ND certification date

### LT Credit Site Selection

Up to 8 points

Exemplary Performance: Earn all 9 points

Preliminary Y

M

Verified

#### Option 1. Sensitive Land Protection (3-4 points)

Y

M

V

#### Path 1. Previously Developed (4 points)

Y

M

V

Total buildable land area (acre or sq ft)

Previously developed buildable land area (acre or sq ft)

0.00%

Percentage of lot previously developed (%)

OR

#### Path 2. Avoidance of Sensitive Land (3 points)

Y

M

V

All new buildings, hardscapes, roads, or parking areas of the project are located on land that meets the following criteria:

Does not consist of prime farmland, unique farmland, or farmland of statewide or local importance.

Was not public parkland prior to acquisition.

Is not in a flood hazard area shown on a legally adopted flood hazard map or otherwise legally designated by the local jurisdiction or state.

Is not on land specifically identified as habitat for species listed in the U.S. Endangered Species Act; the state's endangered species act; NatureServe GH, G1, or G2 lists; or those listed under local equivalent standards (for projects outside the U.S.) that are not covered by NatureServe data.

Is not on land within 50 ft (15 m) of wetlands or within the setback distance from wetlands prescribed by local, state or national regulations, whichever is more stringent.

Is not on land within 100 ft (30 m) of water bodies, including seas, lakes, rivers, streams and tributaries.

AND/OR

**Option 2. Infill Development (2 points)**

Y  M  V

Percent of land within a 1/2 mile (800 meters) from the project boundary that is previously developed

*Alternatively, for projects within city limits of towns with populations less than 20,000*

Percent of land adjacent to the project boundary that is previously developed

AND/OR

**Option 3. Open Space (1 point)**

Y  M  V

Select one of the following:

- Built within 1/2 mile (800 meters) of open space that is at least 3/4 acres (0.3 hectares)
- Create publicly available open space on the project site

AND/OR

**Option 4. Street Network (1 point)**

Y  M  V

Qualifying intersection density (intersections per square mile)

AND/OR

**Option 5. Bicycle Network and Storage (1 point)**

Y  M  V

Bicycle Network

Select one of the following. The project has a functional entry and/or bicycle storage within 200 yd (180 m) of a bicycle network that connects to:

- At least 10 uses
- A school or employment center
- A bus rapid transit stops, rail stations, and/or ferry terminals

Bicycle Storage for Multifamily Buildings

Number of building occupants

Number of residential units

Number of short-term spaces provided

4 Number of short-term spaces required

Number of long-term spaces provided

0 Number of long-term spaces required

Bicycle Storage for Single Family Homes

The project is a single family home with garage.

**LT Credit Compact Development**

Up to 3 points

*Exemplary Performance for Single and Multifamily Lowrise Only: 35 DU/acre (86.5 DU/hectare)*

Preliminary Y  M  Verified

<input type="text"/> 15.59	Total project boundary area (acre)
<input type="text"/> 15.59	Buildable land area (acre)
<input type="text"/> 19	Number of dwelling units
<input type="text"/> 1.22	DU/acre of buildable land

**LT Credit Community Resources**

Up to 2 points

*Exemplary Performance: 16 uses for 1/2 point, 20 uses for 1 point.*

Preliminary Y  M  Verified

Number of community resources within a 1/2 mile (800 meters) walking distance

**LT Credit Access to Transit**

Up to 2 points

*Exemplary Performance: For multiple transit types, 720 weekday trips and 432 weekend trips; For commuter rail or ferry, 120 weekday trips.*

		<b>Preliminary</b>	Y	<input type="text"/>	M	<input type="text"/>	<b>Verified</b>	<input type="text"/>
<i>For projects with multiple transit types</i>								
<input type="text"/>	Number of weekday trips							
<input type="text"/>	Number weekend day trips							
<i>For projects with commuter rail or ferry service only</i>								
<input type="text"/>	Number of weekday trips							

## Sustainable Sites

Preliminary Y 1.5 Maybe 2 Verified 0

### SS Prerequisite Construction Activity Pollution Prevention

#### Required

Verified

Confirm all of the following measures were implemented on the project, as applicable:

True

Stockpiled and protected disturbed topsoil from erosion.

True

Controlled the path and velocity of runoff with silt fencing or comparable measures.

True

Protected on-site storm sewer inlets, streams, and lakes with straw bales, silt fencing, silt sacks, rock filters, or comparable measures.

True

Provided swales to divert surface water from hillsides.

True

Used tiers, erosion blankets, compost blankets, filter socks, berms, or comparable measures to stabilize soils in any area with a slope of 15% (6.6:1) or more that was disturbed during construction.

True

Prevented air pollution from dust and particulate matter.

For construction sites larger than 1 acre

Select one of the following:

☐

The project team created an implemented an Erosion and Sedimentation Control (ESC) plan that conforms to the requirements of the 2012 U.S. Environmental Protection Agency Construction General Permit (CGP).

☐

The project team created an implemented an Erosion and Sedimentation Control (ESC) plan that conforms to local standards and codes, which are as or more stringent than the 2012 EPA Construction General Permit (CGP).

### SS Prerequisite No Invasive Plants

#### Required

Verified

True

No invasive plant species have been introduced into the landscape.

### SS Credit Heat Island Reduction

Up to 2 points

#### Option 1. Shading and Option 2. Nonabsorptive Materials (1-2 points)

Preliminary Y

M

Verified

#### Hardscapes

0

Area of shaded hardscapes (sq ft)

Area of unshaded paving materials with an initial SR value of at least 0.33 (sq ft)

Area of unshaded vegetation in open pavers (sq ft)

Remaining hardscape area (not earning credit) (sq ft)

Total hardscape area (driveways, walkways, patios, etc.) (sq ft)

#### Roof

☐

Area of ENERGY STAR qualified roof (sq ft)

The ENERGY STAR roofing program had a sunset date effective June 1, 2022. Single family projects can use the LEED v4.1 Single Family pathway for 'High-Reflectance Roof. Use roofing materials that have an aged SRI equal to or greater than the values in Table 1. See the rating system for Table 1.' LEED v4 Multifamily projects can pursue the LEED v4.1 Multifamily credit substitution approach as outlined in the LEED v4.1 Guide.

☐

Area of vegetated roof (sq ft)

☐

Remaining roof area (not earning credit) (sq ft)

☐

Total roof area (sq ft)

☐

0%

Percentage of area with shading or nonabsorptive material (%)

## SS Credit Rainwater Management

Up to 3 points

Preliminary

Y

0

M

2

Verified

0

*Exemplary Performance: For Case 1, manage 100% of all stormwater on-site.*

### Case 1. Low Impact Development (1-3 points)

Y

M

2

V

#### Site Characteristics

0 Total lot area (sq ft)

#### Roof

Vegetated roof area (sq ft)  
Roof area directed to a qualifying infiltration feature (sq ft)  
Remaining roof area (not earning credit) (sq ft)  
0 Total roof area (sq ft)

#### Non-roof Site Area

##### Softscape

Total landscape softscape area (sq ft)

##### Hardscape

Permeable paving (sq ft)  
Qualifying open pavers (sq ft)  
Hardscapes directed to qualifying infiltration features (sq ft)  
Remaining hardscape area (not earning credit) (sq ft)  
0 Total hardscape area (driveways, walkways, patios, etc.) (sq ft)

#### Qualifying area, as a percentage of total lot area

0.0% Qualifying area, as percentage of total lot area (%)

#### Reduction of total impermeable area

0 Total impermeable area of the project (sq ft)  
Reference home size (sq ft)  
0.0% Impermeable area as a percentage of reference home size

OR

### Case 2. NPDES Projects (2-3 points)

Y

M

V

Percentile rainfall event



## SS Credit Nontoxic Pest Control

Up to 2 points

*Exemplary Performance: Projects that achieve 2 points can earn another ½ point for each additional strategy, up to a total of 1 point.*

Select all of the following that have been included in the project.		Preliminary	Y	1.5	M	Verified	
<input type="checkbox"/>	Install a steel mesh barrier termite control system. (1 point)						
<input type="checkbox"/>	Install a physical termite barrier system (e.g., basaltic rock) approved by code. (1 point)						
<input type="checkbox"/>	For below-grade walls, use solid concrete foundation walls, masonry walls with a course of solid block bond beam, or concrete-filled block. (0.5 point)						
<input type="checkbox"/>	Install post-tension slabs. (0.5 point)						
<input type="checkbox"/>	Treat all cellulosic structural material (e.g., wood framing) with a registered pesticide containing borates, following the manufacturer's directions for preconstruction treatment. (0.5 point)						
<input type="checkbox"/>	Use noncellulosic material for all structural elements. (0.5 point)						
<input type="checkbox"/>	Install ports or openings for all plumbing elements that penetrate the slab, to allow access for inspection and treatment of pest infestations. (0.5 point)						
<input type="checkbox"/>	Install a registered termite bait system and provide for ongoing maintenance as required by the manufacturer. (0.5 point)						
<input checked="" type="checkbox"/>	Design a minimum 6-inch (150 millimeters) inspection space between the surface of the planned landscape grade and nonmasonry siding. (0.5 point)						
<input checked="" type="checkbox"/>	Seal all external cracks, joints, penetrations, edges, and entry points with appropriate caulking. Install rodent- and corrosion-proof screens (e.g., copper or stainless steel mesh) on all openings greater than ¼ inch (6 millimeters), except where code prohibits their installation. (0.5 point)						
<input checked="" type="checkbox"/>	Design discharge points for rain gutters, air-conditioning condensation lines, steam vent lines, or any other moisture source such that discharge is at least 24 inches (600 millimeters) from the foundation. (0.5 point)						
<input type="checkbox"/>	Design landscape features to provide a minimum 18-inch (450 millimeters) space between the exterior wall and any plantings. (0.5 point)						
<i>For multifamily projects</i>							
<input checked="" type="checkbox"/>	Develop an integrated pest management policy. The policy must include guidance for residents on pesticide use, housekeeping, and prompt reporting of pest problems. The policy must be incorporated in the Homeowner Education Manual. (Required)						

## Water Efficiency

Preliminary Y 3 Maybe 1 Verified 0

### WE Prerequisite Water Metering

Required

Verified

OR

#### Case 2. Multifamily

V

<input type="text"/>
True

A water meter or submeter is installed for each unit.

A water meter or submeter is installed for the whole building.

### WE Credit Total Water Use

Up to 12 points

Exemplary Performance: 70% reduction of indoor and outdoor water consumption

Preliminary Y  M  Verified

0.00%
-------

Total reduction of indoor and outdoor water consumption as calculated in the [Water Reduction Calculator](#) (%)

For single family projects

<input type="text"/>
----------------------

The water pressure does not exceed 60 psi (415 kPa). There are no detectable water leaks. Any installed water softeners are demand initiated.

For multifamily projects

<input type="text"/>
----------------------

There are no detectable water leaks. Any installed water softeners are demand initiated.

### WE Credit Indoor Water Use

Up to 6 points

Preliminary Y  3 M  1 Verified  0

OR

#### Case 2. Multifamily and Midrise

Y  3 M  1 V

True
------

There are no detectable water leaks.

Note: No additional credit is awarded if the fixtures and fittings in non-unit spaces are more efficient than those of in-unit spaces.

Meet any of the following for in-unit spaces and non-unit spaces:

Lavatory Faucet (1-2 points)

True
1.20

All installed lavatory faucets and/or faucet aerators are WaterSense labeled.

Average rated flow volume across all lavatory faucets (gpm)

Showerheads (1-2 points)

True
1.50

All installed showerhead fixtures and fittings are WaterSense labeled.

Average rated flow volume per shower compartment (gpm)

Toilets (1 point)

<input type="text"/>
<input type="text"/>

All installed toilet fixtures and fittings are WaterSense labeled.

Average rated flush volume across all toilets (gpf)

Clothes Washers (1 point)

<input type="text"/>
----------------------

All clothes washers are ENERGY STAR qualified or performance equivalent

### WE Credit Outdoor Water Use

Up to 4 points

Preliminary Y  M  Verified

<input type="text"/>
<input type="text"/>

Turf grass area as a percentage of total landscape softscape area (%)

Native or adapted plant area as a percentage of total landscape softscape area (%)

## Energy and Atmosphere

Preliminary Y 22

Maybe 6

Verified 0

### EA Prerequisite Minimum Energy Performance

#### Required

Verified

##### ENERGY STAR

True

ENERGY STAR version 3 checklists are complete

60

HERS index rating

70

ENERGY STAR HERS index target

OR

ENERGY STAR Builder Option Package has been followed and all requirements met.

Is the project pursuing LI 10492, 10491, or 10486?

If pursuing ENERGY STAR MFNC, which version did the project earn?

If pursuing ENERGY STAR SNFH, which version did the project earn?

##### ENERGY STAR Qualified Appliances

Select at least one of the following:

True

ENERGY STAR refrigerator is installed.

ENERGY STAR dishwasher is installed.

ENERGY STAR clothes washer is installed.

##### Duct Runs

True

All duct runs are fully ducted.

### EA Prerequisite Energy Metering

#### Required

Verified

##### Case 1. Single Family

V

A whole-house electric meter is installed.

A whole-house gas meter is installed.

OR

##### Case 2. Multifamily

V

True

Electric submeters are installed in each residential unit.

N/A

A whole-building gas meter or submeter for each residential unit is installed.

### EA Prerequisite Education of Homeowner, Tenant, or Building Manager

#### Required

Verified

True

An operations and maintenance manual, binder, or CD has been/will be provided to all individuals or organizations responsible for the maintenance of the home.

True

A minimum one-hour walkthrough of the home with the occupants has been conducted.

## EA Credit Annual Energy Use

Up to 29 points

Preliminary Y

20

M

5

Verified

0

Exemplary Performance: For Option 1, 100% reduction; For Option 2, -10 HERS index rating.

Projects may choose to pursue either Option 1 or Option 2 based on the option that produces the most points.

Y

20

M

5

V

### Option 1. LEED Energy Budget (1-29 points)

	LEED Energy Budget (MMBtu/year)
	Annual energy consumption (MMBtu/year)
	Percent reduction below LEED Energy Budget (%)
	<b>Total Points</b>

Other major energy users not included in the energy rating (if any):

	Heated driveway		Spa
	Private pool		Heated garage
			Other (describe in detail)

OR

### Option 2. HERS Index with Home Size Adjuster (0.5-29 points)

Y

M

V

60	HERS index rating
	Number of bedrooms
	Conditioned floor area of the house (sq ft)
	ENERGY STAR for Homes, version 3, reference home floor area (sq ft)
	HSA points
14	Points for achieving HERS index rating
	<b>Total (HSA points + Points for achieving HERS index rating)</b>

## EA Credit Efficient Hot Water Distribution System

Up to 5 points

Preliminary Y

2

M

0

Verified

0

### Option 1. Efficient Hot Water Distribution (2 points)

Y

2

M

0

V

0

Note: Projects using heat traces that serve a single unit or house are awarded only half credit.

For projects using circulating systems (required for both Path 1 AND Path 2 below)

	Circulating pump does not operate continuously, is not on a timer, or is not on a water temperature sensor.
	Circulating pump is demand activated by a momentary contact switch, motion sensor, flow switch, door switch or voice command.
	After the pump starts, the controls allow the pump to operate until the water temperature in the return pipe rises not more than 10°F (6 °C) above the initial temperature of the water in the pipe. Controls limit the water temperature to a maximum of 105°F (40 °C). Controls limit pump operation to not more than 5 minutes per activation in the event that both means of shutting off the pump have failed.
	Circulating hot water systems have with an automatic or readily accessible manual switch to turn off the hot water circulating pump when not in use.

For projects using heat-traced piping systems

	Piping is insulated.
--	----------------------

### Path 1. Maximum Allowable Pipe Length (2 points)

Y

M

V

	Pipe or tube length installed (ft)
	Nominal pipe size (in)
	Maximum pipe or tube length allowed for water heaters, boilers with no circulation loop or heat traced pipe or in multifamily buildings a central circulation loop or heat traced pipe (ft)
	Maximum pipe or tube length allowed for circulation loop or heat traced pipe serving a single unit or house (ft)

OR

### Path 2. Maximum Allowable Pipe Volume (2 points)

Y

2

M

V

	Volume of hot or tempered water from source to termination (oz)
--	---

OR

**Option 2. Performance Test (3 points)**

Y  M  V

*Note: Projects using heat traces that serve a single unit or house are awarded only half credit.*

*For projects using circulating systems (required for both Case 1 AND Case 2 below)*

Circulating pump does not operate continuously, is on a timer, or is on a water temperature sensor.

Circulating pump is demand activated by a momentary contact switch, motion sensor, flow switch, door switch or voice command.

After the pump starts, the controls allow the pump to operate until the water temperature in the return pipe rises not more than 10°F (6 °C) above the initial temperature of the water in the pipe. Controls limit the water temperature to a maximum of 105°F (40 °C). Controls limit pump operation to not more than 5 minutes per activation in the event that both means of shutting off the pump have failed.

Circulating hot water systems have with an automatic or readily accessible manual switch to turn off the hot water circulating pump when not in use.

*For projects using heat-traced piping systems*

Piping is insulated.

**Case 1. Hot water source is a water heater or boiler with no circulation loop or heat traced pipe; or in multifamily buildings a central circulation loop or heat traced pipe.**

Y  M  V

Meets WaterSense Labeled New Homes requirements

OR

Tested volume of water stored in piping (gal)

OR

**Case 2. Hot water source is a circulation loop or heat traced pipe serving a single unit or house**

Y  M  V

Tested volume of water stored in piping (gal)

AND/OR

Y  M  V

**Option 3. Pipe Insulation (2 points)**

Insulation R-value

**EA Credit Advanced Utility Tracking**

Up to 2 points

**Preliminary** Y  M  **Verified**

*Exemplary Performance: Meter separate energy usage information for at least four end uses.*

**Case 1. Single Family**

Y  M  V

**Option 1. Electric and Water (1 point)**

Select one of the following:

Y  M  V

A permanent energy-monitoring system that records at intervals of one hour or less has been installed.

The house has an automatic in-ground irrigation system and landscaped irrigated area larger than 1,000 sq ft (93 sq m) and has installed a submeter to monitor all irrigation system components.

AND/OR

**Option 2. Third-Party Utility Reporting (1 point)**

Y  M  V

The homeowner has shared all applicable utility data with USGBC via a USGBC-approved third-party.

**Case 2. Multifamily**

Y  M  V

**Option 1. Electric and Water (1 point)**

Select one of the following:

Y  M  V

A permanent energy-monitoring system that records at intervals of one hour or less has been installed in each unit.

The project has an automatic in-ground irrigation system and landscaped irrigated area larger than 1,000 sq ft (93 sq m) and has installed a submeter to monitor all irrigation system components.

AND/OR

**Option 2. Third-Party Utility Reporting (1 point)**

Y  M  V

**Path 1. Whole-Building Master Meter**

Y  M  V

The building owner has shared all applicable utility data with USGBC via a USGBC-approved third-party.

OR

**Path 2. Individual Unit Meters**

Y  M  V

At least 50% of unit owners or occupants have shared all applicable utility data with USGBC via a USGBC-approved third-party.

**EA Credit Active Solar-Ready Design**

1 point

**Preliminary** Y  M  **Verified**

*Exemplary Performance: Achieve Option 1 and Option 2.*

**Option 1. Photovoltaic-Ready Design (1 point)**

Y  M  V

*Note: Projects that install a photovoltaic (PV) system that meets the requirements of EA Credit Renewable Energy are not eligible for this credit.*

The house meets EPA's solar photovoltaic specifications for a renewable energy-ready home.

AND/OR

**Option 2. Solar Direct Hot Water-Ready Design (1 point)**

Y  M  V

*Note: Projects that install a solar direct hot water (DHW) system that meets the requirements of EA Credit Efficient Domestic Hot Water Equipment are not eligible for this credit.*

Meets EPA's solar water heating specifications for a renewable energy-ready home.

**EA Credit HVAC Start-Up Credentialing**

1 point

**Preliminary** Y  M  **Verified**

Name of technician

Company of technician

Technician commissioning all heating, cooling, and ventilation systems has the following credential

# Materials and Resources

Preliminary Y 4.5 Maybe 3 Verified 0

## MR Prerequisite Certified Tropical Wood

Required

Verified

True All wood in the building is nontropical, reused or reclaimed, or certified by the Forest Stewardship Council, or USGBC-approved equivalent.

## MR Prerequisite Durability Management

Required

Verified

True ENERGY STAR for Homes, version 3, water management system checklist is collected from builder.

Confirm all of the following have been implemented on the project:

True Nonpaper-faced backer board, or a product or coating over wallboard that meets standard ASTM D 3273 standard, was installed on the area above bathtub, spa or shower, and in areas behind fiberglass enclosures where wallboard is installed.

True Water-resistant flooring was installed in the kitchen, bathroom(s), laundry room, spa area(s). No carpet was installed in these areas.

True Water-resistant flooring was installed in entryways within 3 feet of exterior door(s).

True A drain and drain pan, drain pan and automatic water shut-off or flow restrictors, or floor drain with floor sloped to drain was installed for all tank water heaters in or over living space.

True A braided washer hose, drain and drain pan, drain pan and automatic water shut-off or flow restrictors, or floor drain with floor sloped to drain was installed for clothes washer in or over living space.

True Conventional clothes dryers exhaust directly to outdoors.

## MR Credit Durability Management Verification

1 point

Preliminary Y  1 M  Verified

True Each measure in the ENERGY STAR for Homes, version 3, water management system builder checklist was verified by the verification team.

### MR Credit Environmentally Preferable Products

Up to 4 points

Preliminary Y  M  Verified

Exemplary Performance: For Option 2, achieve a minimum of 4 points to earn another 2 points for purchasing products that meet the requirements.

#### Option 1. Local Production

Preliminary Y  M  Verified

Select which the following were extracted, processed, and manufactured within 100 miles (160 km) of the project site:

<input type="text"/>	Percentage of locally produced framing (%) (0.5 point)
<input type="text"/>	Percentage of locally produced aggregate for concrete and foundation (%) (0.5 point)
<input type="text"/>	Percentage of locally produced drywall and interior sheathing (%) (0.5 point)

AND/OR

#### Option 2. Environmentally Preferable Products

Preliminary Y  M  Verified

Select the criteria met by at least 90% of the component:

No Floor Covering (2 points)	
Floor Covering (1 point)	At least 25% postconsumer or 50% preconsumer recycled content
Insulation (1 point)	At least 25% postconsumer or 50% preconsumer recycled content
Sheathing (1 point)	
Framing (1 point)	
Drywall (1 point)	For synthetic, 95% recycled content (pre-, post-, or combination)
Concrete (1 point)	
Roofing (1 point)	
Siding (1 point)	

Select criteria met for at least 3 of the following additional components by at least 90% of the component (1 point):

Doors	
Cabinets	
Counters	
Interior Trim	
Decking/Patio	
Windows	

### MR Credit Construction Waste Management

Up to 3 points

Exemplary Performance: For renovation projects, track and divert at least 50% of demolition waste.

Preliminary Y  M  Verified

<input type="text"/>	LEED Reference Home Baseline Waste (lbs)
<input type="text"/>	Total Construction Waste (including recycled waste) (lbs)
<input type="text"/>	Recycled Waste (lbs)
<input type="text" value="0.00"/>	Project Construction Waste (lbs)
<input type="text"/>	Percent reduction below baseline (%)



## MR Credit Material-Efficient Framing

Up to 2 points

*Exemplary Performance: Achieve a minimum of 2 points to earn up to 1/2 point for each additional requirement met.*

Preliminary Y  M  Verified

Select one of the following for at least 90% of each component: (1 point)

<input type="text"/>	No more than one horizontal 2x top plate on walls by aligning studs with joists and roof rafters was installed.
<input type="text"/>	Window and door headers were placed in the rim joist.
<input type="text"/>	Raised (directly beneath the top plate), single-ply headers not more than 2 inches nominal thickness in a 2x4 wall or 4 inches nominal thickness in a 2x6 wall, were installed.
<input type="text"/>	Structural insulated panels (SIPs) were installed for walls.

Select at least 2 of the following for at least 90% of each component: (0.5 point)

<input type="text" value="True"/>	Headers were sized for actual loads.
<input type="text" value="True"/>	Ladder blocking or drywall clips were used.
<input type="text"/>	Two-stud corners or California corners were used.

Select all that apply for at least 90% of each component: (0.5 point each)

<input type="text"/>	Interior wall studs were spaced greater than 16 inches (400 mm) o.c.
<input type="text"/>	Floor joists were spaced greater than 16 inches (400 mm) o.c. or SIPs.
<input type="text" value="True"/>	Roof rafters were spaced greater than 16 inches (400 mm) o.c. or SIPs.

## Indoor Environmental Quality

Preliminary Y 8

Maybe 1

Verified 0

### EQ Prerequisite Ventilation

Required

Verified

OR

#### Case 2. Multifamily

V

##### Local Exhaust

Confirm all of the following have been implemented on the project:

True

Local exhaust systems meeting the requirements of ASHRAE Standard 62.2-2010, Sections 5 and 7 or local equivalent, whichever is more stringent, were installed in all bathrooms (including half-baths) and the kitchen.

True

Local exhaust systems exhaust air directly to the outdoors.

True

All bathroom exhaust fans are ENERGY STAR-labeled or an HRV or ERV is used.

True

For exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (188 liters per second), makeup air is provided at a rate approximately equal to the exhaust air rate. Makeup air systems have a means of closure and can be automatically controlled to start and operate simultaneously with the exhaust system.

##### Whole Unit Mechanical Ventilation

True

The project meets ASHRAE Standard 62.2-2010 Sections 4 and 7 or local equivalent, whichever is more stringent.

##### Non-Unit Spaces

True

The project meets the minimum requirements of ASHRAE Standard 62.1-2010 Sections 4 -7 or local equivalent, whichever is more stringent.

The project is located in a nonattainment area for PM2.5. The project has installed MERV 11 or higher filters.

The project is located in a nonattainment area for ozone.

### EQ Prerequisite Combustion Venting

Required

Verified

The project has earned the EPA Indoor airPLUS label

OR

True

No unvented combustion appliances were installed (ovens and ranges excluded).

True

A carbon monoxide (CO) monitor is installed on each floor, hard-wired with a battery backup.

*For projects with fireplaces or woodstoves installed*

N/A

Provide doors that close or a solid glass enclosure.

N/A

Closed-combustion, power-vented or passes BPI or RESNET combustion safety protocols

*For projects where space and water heating equipment involving combustion are installed*

Select one of the following:

Equipment is installed with closed combustion (i.e. sealed supply air and exhaust ducting)

Equipment is installed with power-vented exhaust

Equipment is located in a detached utility building or open-air facility

### EQ Prerequisite Garage Pollutant Protection

#### Required

Verified

<input type="checkbox"/>	The project has earned the EPA Indoor airPLUS label
OR	
<input type="checkbox"/>	All air-handling equipment and ductwork is placed outside the fire-rated envelope of the garage.
<input type="checkbox"/>	Shared surfaces between the garage and conditioned spaces are tightly sealed.

#### Conditioned Spaces Above Garage

<input type="checkbox"/>	All penetrations and all connecting floor and ceiling joist bays are sealed.
--------------------------	--

#### Conditioned Spaces Next to Garage

<input type="checkbox"/>	All doors are weather-stripped.
<input type="checkbox"/>	Carbon monoxide detectors are installed in rooms that share a door with the garage.
<input type="checkbox"/>	All penetrations and all cracks at the base of the walls are sealed.

### EQ Prerequisite Radon-Resistant Construction

#### Required

Verified

*Exemplary Performance: For projects in radon zones 2 and 3, install a qualifying passive radon ventilation system.*

#### EPA Indoor airPLUS label

V

<input type="checkbox"/>	The project has earned the EPA Indoor airPLUS label
--------------------------	---

OR

#### Case 1. New Construction

V

<input type="checkbox"/>	EPA radon zone
--------------------------	----------------

#### For projects in EPA radon zone 1

<input type="checkbox"/>	There is a capillary break per the Indoor airPLUS specifications.
<input type="checkbox"/>	An electrical outlet has been provided near vent piping in the attic to facilitate future fan installation.
<input type="checkbox"/>	A gas-tight vertical vent pipe extending up through the conditioned spaces and terminating above the roof opening has been installed.

OR

<input type="checkbox"/>	The house is elevated by at least 2 feet (600 millimeters) with open air space between building and ground or there is a garage under the building.
--------------------------	---

OR

#### Case 2. Renovation of Existing Building

V

<input type="checkbox"/>	EPA radon zone
--------------------------	----------------

#### For renovation projects in EPA radon zone 1 with no slab work being performed

<input type="checkbox"/>	Radon test results (pCi/L)
<input type="checkbox"/>	If results are greater than 4 pCi/L, an active ventilation system has been installed.

### EQ Prerequisite Air Filtering

#### Required

Verified

<input type="checkbox"/>	The project has earned the EPA Indoor airPLUS label
OR	
<input type="checkbox"/>	MERV rating of filters on recirculating space conditioning systems
<input type="checkbox"/>	MERV rating of filters on mechanically supplied outdoor air systems with 10 ft (3 m) or more of ductwork

### EQ Prerequisite Environmental Tobacco Smoke

#### Required

Verified

*For multifamily projects*

☐ True

Smoking is prohibited in all common areas of the building.

☐ True

Smoking is prohibited outside the project building(s) except in designated smoking areas located at least 25 ft (7.5 m) from all entries, outdoor air intakes, and operable windows.

☐ True

Signage communicating the smoking policy has been installed.

### EQ Prerequisite Compartmentalization

#### Required

Verified

*For multifamily and attached single-family projects*

☐ True

Each residential unit has sealed penetrations through walls, ceilings, and floors and vertical chases adjacent to units.

☐ True

All doors in the residential units leading to common hallways have weather-stripping.

☐ True

All exterior doors and operable windows have weather-stripping.

Blower door test results (cfm50)

Envelope enclosure area (sq ft)

0.00

Leakage per area of enclosure (cfm50/sq ft)

### EQ Credit Enhanced Ventilation

Up to 3 points

Preliminary

Y

M

Verified

#### Option 1. Enhanced Local Exhaust (1 point)

Y

M

V

Bathroom exhaust fan control type in every bathroom with a shower, bathtub, or spa

AND/OR

#### Option 2. Enhanced Whole-House Ventilation (2 points)

Y

M

V

A balanced whole-house ventilation system was designed and installed that meets ASHRAE 62.2-2010 sections 4 and 7 in each home or unit.

The system does not exceed ASHRAE 62.2-2010 requirements by more than 10%.

### EQ Credit Contaminant Control

Up to 2 points

Preliminary

Y

M

Verified

*Exemplary Performance: Achieve a minimum of 2 1/2 points to earn another 1/2 point.*

#### Option 1. Walk-off Mats (0.5 point)

Y

M

V

For all primary entryways, a permanent walk-off mat that is at least 4 feet (1.2 meters) long and allows access for cleaning has been installed.

*For multifamily projects*

For exterior entryways in common areas, permanent systems that are at least 10 feet (3 meters) long have been installed.

AND/OR

#### Option 2. Shoe Removal and Storage (0.5 point)

Y

M

V

A shoe removal and storage space is near the primary entryway.

No conventional carpet is installed in shoe removal and storage area.

AND/OR

**Option 3. Preoccupancy Flush (0.5 point)**

Y  M  V

The project has earned the EPA Indoor airPLUS label

OR

At installation, all permanent ducts and vents were sealed to minimize contamination from construction.

After construction ends and before occupancy

Any dust and debris was removed from ducts.

The home was flushed out for 48 hours, with all windows open, a fan run continuously or all HVAC fans and exhaust fans.

AND/OR

**Option 4. Air Testing (1 point)**

Y  M  V

The building was tested for indoor air contaminants and maximum concentrations were not exceeded.

**EQ Credit Balancing of Heating and Cooling Distribution Systems**

Up to 3 points

**Preliminary** Y  M  **Verified**

**Case 1. Forced-Air Systems**

Y  M  V

**Option 1. Multiple Zones (1 point)**

Y  M  V

A system with at least two space-conditioning zones with independent thermostatic controls has been installed.

OR

The project is a single family home less than 800 sq ft (74 sq m) or a multifamily building whose average unit size is less than 1,200 sq ft (110 sq m).

AND/OR

**Option 2. Supply Air-Flow Testing (1 point)**

Y  M  V

The supply air-flow rates are within +/- 20% (or +/- 25 cfm or 11 lps) of calculated values from ACCA Manual J.

AND/OR

**Option 3. Pressure Balancing (1 point)**

Y  M  V

The pressure differential between bedroom and rest of the house is less than 3 Pa.

OR

**Case 2. Radiative Systems**

Y  M  V

**Option 1. Multiple Zones (1 point)**

Y  M  V

A system with at least two zones with independent thermostatic controls has been installed

Each zone has a separate loop and pump controlled automatically by a thermostat control.

OR

The project is a single family home less than 800 sq ft (74 sq m) or a multifamily building whose average unit size is less than 1,200 sq ft (110 sq m).

AND/OR

**Option 2. Room-by-Room Controls (2 points)**

Y  M  V

Room-by-room thermostatic controls are installed.

### EQ Credit Enhanced Compartmentalization

1 point

Preliminary Y  M  Verified

0.00 Leakage per area of enclosure (cfm50/sq ft)

### EQ Credit Enhanced Combustion Venting

Up to 2 points

Preliminary Y  2 M  0 Verified  0

#### Option 1. No Fireplace or Woodstove (2 points)

Y  2 M  V

True No fireplaces or woodstoves have been installed.

OR

#### Option 2. Enhanced Combustion Venting Measures (1 point)

Y  M  V

The project has earned the EPA Indoor airPLUS label

OR

EPA qualified wood- or pellet-burning fireplaces with either power or direct venting have been installed.  
 A natural gas, propane, or alcohol stove approved by a safety testing facility and has power or direct venting has been installed.  
 A natural gas, propane, or alcohol stove has a permanently fixed glass front or gasketed door and an electronic pilot.

### EQ Credit Enhanced Garage Pollutant Protection

Up to 2 points

Preliminary Y  2 M  0 Verified  0

OR

#### Case 2. Multifamily

Y  2 M  0 V  0

#### Option 1. Exhaust Fan in Multicar Garage (1 point)

Y  M  V

Meet all of the following:

All of the requirements in ASHRAE 62.1-2010 for garage ventilation have been met.  
 The garage has sufficient exhaust to create negative pressure with respect to adjacent spaces with the doors to the garage closed.  
 Self-closing doors have been installed. Deck-to-deck partitions or a hard lid ceiling have been installed.  
 The exhaust fan either runs continuously or is on a carbon monoxide sensor that turns on the fan when ambient CO levels reach 35 ppm.

OR

#### Option 2. Exhaust Fan in Small Garage (1 point)

Y  M  V

Meet all of the following:

An exhaust fan that meets ENERGY STAR minimum efficacy levels (cfm/W) has been installed.  
 Installed direct-exhaust fans are 100 cfm (47 lps) or greater.  
 Installed ducted exhaust fans are 130 cfm (61 lps) or greater.  
 The exhaust fan either runs continuously or has an automatic timer control linked to an occupant sensor, a light switch, a garage door opening-closing mechanism, or a carbon monoxide sensor that turns on the fan when ambient CO levels reach 35 ppm, or equivalent.  
 The exhaust fan has an automatic timer set to provide at least three air changes each time the fan is turned on.

OR

#### Option 3. No Garage, or Detached Garage (2 points)

Y  2 M  V

True No garage has been constructed.  
 A detached garage has been constructed.

**EQ Credit Low-Emitting Products**

Up to 3 points

**Preliminary** Y  M  **Verified**

Select all that apply. At least 90% of a component must meet the requirement:

- ☒ True Site-applied interior paints and coatings have been tested and meet the requirements of CA Section 01350. (0.5 point)
- ☒ True Flooring has been tested and meets the requirements of CA Section 01350. (0.5 point)
- ☐ Insulation has been tested and meets the requirements of CA Section 01350. (0.5 point)
- ☐ Site-applied adhesives and sealants have been tested and meet the requirements of CA Section 01350. (0.5 point)
- ☐ Composite wood products have been tested and meet the California Air Resources Board requirements for ultra-low-emitting formaldehyde (ULEF) resins or no-added formaldehyde based resins. (1 point)

## Innovation

Preliminary Y 2

Maybe 0

Verified 0

### IN Prerequisite Preliminary Rating

Required

Verified

True

Preliminary rating and meeting are complete.

### IN Credit Innovation

To achieve all five innovation points, a project team must achieve at least one pilot credit, at least one innovation credit and no more than two exemplary performance  
Up to 5 points

Preliminary Y 1

M 0

Verified 0

#### Option 1. Innovation (1 point)

Describe the intent of the proposed innovation credit.

Housing type and affordability

Y 1

M

V

AND/OR

#### Option 2. Pilot (1 point)

Y

M

V

Pilot credit name

AND/OR

#### Option 3. Additional Strategies (0.5-3 points)

Y

M

V

Exemplary Performance: 1-2 points

Strategy

Credit name

Strategy

Credit name

Strategy

Credit name

Strategy

Credit name

Strategy

Credit name

Strategy

Credit name

### IN Credit LEED Accredited Professional

1 point

Preliminary Y 1

M

Verified

Name of credential holder



# Regional Priority

Preliminary Y 0 Maybe 1 Verified 0

## RP Credit Regional Priority

Up to 4 points

Preliminary Y  M  Verified

Regional priority credits may be found on [www.usgbc.org/rpc](http://www.usgbc.org/rpc).

Regional Priority Credit Name	Required Threshold
Community Resources	2
Heat Island Reduction	2
Access to Transit	2
Compact Development	3
Rainwater Management (maybe)	2
Material Efficient Framing	2



# ENERGY STAR Single-Family New Homes

## National Rater Design Review Checklist, Version 3 / 3.1 / 3.2 (Rev. 13)

If pursuing Track A - HVAC Grading, complete this page. <sup>1</sup>

Home Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Permit Date: \_\_\_\_\_

### 1. Partnership Status

Must Correct	Rater <sup>2</sup> Verified	N/A <sup>3</sup>
--------------	-----------------------------	------------------

1.1 Rater has verified and documented that builder has an ENERGY STAR partnership agreement using <a href="http://www.energystar.gov/ResPartnerDirectory">www.energystar.gov/ResPartnerDirectory</a> . <sup>4</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
1.2 Rater has verified and documented that their company has an ENERGY STAR partnership agreement using <a href="http://www.energystar.gov/ResPartnerDirectory">www.energystar.gov/ResPartnerDirectory</a> . <sup>5</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
1.3 Rater(s) signing checklists attest that they have completed EPA-recognized training and are credentialed by a Home Certification Organization (HCO).	<input type="checkbox"/>	<input type="checkbox"/>	-

### 2. High-Performance Fenestration

2.1 Specified fenestration meets or exceeds 2009 IECC or, for National v3.2, 2021 IECC requirements. <sup>6, 7</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
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### 3. High-Performance Enclosure

3.1 Specified total building thermal envelope UA achieves ≤ 100% of the total UA resulting from the U-factors in 2009 IECC Table 402.1.3 or, for National v3.2, 2021 IECC Table 402.1.2. See exception in Fn. 8. <sup>7,8,9,10</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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### 4a. Review of ANSI / RESNET / ACCA / ICC 310 HVAC Design Report with ENERGY STAR Supplement <sup>11</sup>

4a.1 HVAC design report compliant with ANSI / RESNET / ACCA / ICC 310, and the National HVAC Design Supplement to Std. 310 for Dwellings & Units, collected for records, with no applicable Items left blank. <sup>12</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
4a.2 ANSI / RESNET / ACCA / ICC 310 design review criteria have been met for applicable housing type.	<input type="checkbox"/>	<input type="checkbox"/>	-
4a.3 Cooling sizing % is within the cooling sizing limit selected by the HVAC designer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rater Name: \_\_\_\_\_ Date of Review: \_\_\_\_\_

Rater Signature: \_\_\_\_\_ Rater Company Name: \_\_\_\_\_



# ENERGY STAR Single-Family New Homes

## National Rater Design Review Checklist, Version 3 / 3.1 / 3.2 (Rev. 13)

**If pursuing Track B - HVAC Credential, complete this page.**

Home Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Permit Date: \_\_\_\_\_

### 1. Partnership Status

Must Correct	Rater <sup>2</sup> Verified	N/A <sup>3</sup>
--------------	-----------------------------	------------------

1.1 Rater has verified and documented that builder has an ENERGY STAR partnership agreement using [www.energystar.gov/ResPartnerDirectory](http://www.energystar.gov/ResPartnerDirectory). <sup>4</sup>

<input type="checkbox"/>	<input type="checkbox"/>	-
--------------------------	--------------------------	---

1.2 Rater has verified and documented <sup>13</sup> that HVAC contractor holds credential required to complete National HVAC Commissioning Checklist, unless all equipment to be installed in home to be certified is an exempted type, in which case check "N/A". <sup>14</sup>  
HVAC Contractor Company Name: \_\_\_\_\_

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

1.3 Rater has verified and documented that their company has an ENERGY STAR partnership agreement using [www.energystar.gov/ResPartnerDirectory](http://www.energystar.gov/ResPartnerDirectory). <sup>5</sup>

<input type="checkbox"/>	<input type="checkbox"/>	-
--------------------------	--------------------------	---

1.4 Rater(s) signing checklists attest that they have completed EPA-recognized training and are credentialed by a Home Certification Organization (HCO).

<input type="checkbox"/>	<input type="checkbox"/>	-
--------------------------	--------------------------	---

### 2. High-Performance Fenestration

2.1 Specified fenestration meets or exceeds 2009 IECC or, for National v3.2, 2021 IECC requirements. <sup>6, 7</sup>

<input type="checkbox"/>	<input type="checkbox"/>	-
--------------------------	--------------------------	---

### 3. High-Performance Enclosure

3.1 Specified total building thermal envelope UA achieves  $\leq 100\%$  of the total UA resulting from the U-factors in 2009 IECC Table 402.1.3 or, for National v3.2, 2021 IECC Table 402.1.2. See exception in Fn. 8. <sup>7, 8, 9, 10</sup>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

### 4b. Review of ENERGY STAR National HVAC Design Report <sup>15, 16</sup>

4b.1 National HVAC Design Report collected for records, with no applicable items left blank.

<input type="checkbox"/>	<input type="checkbox"/>	-
--------------------------	--------------------------	---

4b.2 National HVAC Design Report reviewed by Rater for the following parameters (National HVAC Design Report Item # in parenthesis):

4b.2.1 Cooling season and heating season outdoor design temperatures used in loads (3.3) are within the limits defined for the State and County, or US Territory, where the home will be built, or the designer has provided an allowance from EPA to use alternative values. All limits are published at [energystar.gov/hvacdesigntemps](http://energystar.gov/hvacdesigntemps). Note that revised (i.e., 2019 Edition) limits are required to be used for all HVAC Design Reports generated after 10/01/2020. <sup>17</sup>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4b.2.2 Number of occupants used in loads (3.4) is within  $\pm 2$  of the home to be certified. <sup>18</sup>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4b.2.3 Conditioned floor area used in loads (3.5) is between 100 sq. ft. smaller and 300 sq. ft. larger than the home to be certified. <sup>19</sup>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4b.2.4 Window area used in loads (3.6) is between 15 sq. ft. smaller and 60 sq. ft. larger than the home to be certified, or, for homes to be certified with  $> 500$  sq. ft. of window area, between 3% smaller and 12% larger. <sup>20</sup>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4b.2.5 Predominant window SHGC used in loads (3.7) is within 0.1 of predominant value in the home to be certified. <sup>21</sup>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4b.2.6 Sensible, latent, & total heat gain are documented (3.10 - 3.12) for the orientation of the home to be certified. <sup>22</sup>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4b.2.7 The variation in total heat gain across orientations (3.13) is  $\leq 6$  kBtu/h. <sup>22</sup>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4b.2.8 Cooling sizing % (4.13) is within the cooling sizing limit (4.15) selected by the HVAC designer.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

Rater Name: \_\_\_\_\_ Date of Review: \_\_\_\_\_

Rater Signature: \_\_\_\_\_ Rater Company Name: \_\_\_\_\_



# ENERGY STAR Single-Family New Homes

## National Rater Design Review Checklist, Version 3 / 3.1 / 3.2 (Rev. 13)

### Footnotes

1. Track A – HVAC Grading shall use ANSI / RESNET / ACCA / ICC 310 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the schedule defined by the HCO that the home is being certified under.
2. All items shall be verified for each certified home and sampling protocols shall not be used. 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 or Approved Inspector, as defined by ANSI / RESNET / ICC 301, or an equivalent designation as determined by an HCO; and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/newhomestraining](http://www.energystar.gov/newhomestraining).
3. The column titled "N/A," which denotes items that are "not applicable," should be used when the checklist item is not present in the home or conflicts with local requirements.
4. Raters are only required to document the partnership status of a builder once, for the first home that the Rater certifies for them.
5. Raters are only required to document the partnership status of their company once, for the first home that the Rater certifies for them.
6. For all versions except National v3.2, all windows, doors and skylights shall meet or exceed the component U-factor and SHGC requirements specified in 2009 IECC Table 402.1.1. For National v3.2, all windows, doors and skylights shall meet or exceed the component U-factor and SHGC requirements in 2021 IECC Table 402.1.2.

If no NFRC rating is noted on the window or in product literature (e.g., for site-built fenestration), select the U-factor and SHGC value from Tables 4 and 10, respectively, in 2013 ASHRAE Fundamentals, Chapter 15. Select the highest U-factor and SHGC value among the values listed for the known window characteristics (e.g., frame type, number of panes, glass color, and presence of low-e coating). Note that the U-factor requirement applies to all fenestration while the SHGC only applies to the glazed portion. The following exceptions apply:

- a. An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements;
- b. An area-weighted average of fenestration products  $\geq 50\%$  glazed shall be permitted to satisfy the SHGC requirements;
- c. 15 square feet of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements, and shall be excluded from area-weighted averages calculated using a) and b), above;
- d. One side-hinged opaque door assembly up to 24 square feet in area shall be exempt from the U-factor requirements and shall be excluded from area-weighted averages calculated using a) and b), above;
- e. Fenestration utilized as part of a passive solar design shall be exempt from the U-factor and SHGC requirements, and shall be excluded from area-weighted averages calculated using a) and b), above. Exempt windows shall be facing within 45 degrees of true South and directly coupled to thermal storage mass that has a heat capacity  $> 20 \text{ btu} / \text{ft}^3 \times \text{F}$  and provided in a ratio of at least 3 sq. ft. per sq. ft. of South facing fenestration. Generally, thermal mass materials will be at least 2 in. thick.

In Phius or PHI certified homes, where triple-glazed window assemblies with thermal breaks / spacers between the panes are used, such windows meet the intent of Item 2.1 and shall be excluded when assessing compliance of a) through e), above.

7. For all Versions except National v3.2, the 2009 IECC Climate Zone designations are applicable, as defined and illustrated in [Section R301](#) of the code. For National v3.2, 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.
8. For all Versions except National v3.2 the total building thermal envelope UA shall be less than or equal to the total UA resulting from multiplying the U-factors in 2009 IECC Table 402.1.3 by the same assembly area as the home to be certified.

For National v3.2, the total building thermal envelope UA shall be less than or equal to the total UA resulting from multiplying the U-factors in 2021 IECC Table 402.1.2 by the same assembly area as the home to be certified. Exception for homes permitted before 01/01/2025 and certified using National v3.2: the total building thermal envelope UA shall be less than or equal to 105% of the total UA resulting from multiplying the U-factors in 2021 IECC Table 402.1.2 by the same assembly area as the home to be certified.

The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The calculation for a steel-frame envelope assembly shall use the ASHRAE zone method or a method providing equivalent results, and not a series-parallel path calculation method. In jurisdictions designated by a code official as having Very Heavy Termite Infestation, the total UA limit shall be calculated by replacing the code-required slab insulation R-value and depth with the slab insulation R-value and depth specified in the Rated Home.

The performance of all components (i.e., ceilings, walls, floors, slabs, and fenestration) can be traded off using the UA approach. Note that Items 3.1 through 3.4 of the National Rater Field Checklist shall be met regardless of the UA tradeoffs calculated.

9. Slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall. The following alternatives apply:
  - a. Slab assemblies with an F-Factor equivalent to that of the insulation required in Item 3.2 of the National Rater Field Checklist may be used. F-Factors shall be determined using Table A6.3.1-1 from ASHRAE 90.1-2022 Appendix A. See [www.energystar.gov/F-Factor](http://www.energystar.gov/F-Factor) for more details.
  - b. The thermal break is permitted to be created using  $\geq R-3$  rigid insulation on top of the slab. In such cases, up to 10% of the slab surface is permitted to not be insulated (e.g., for sleepers, for sill plates). Insulation installed on top of slab shall be covered by a durable floor surface (e.g., hardwood, tile, carpet).
10. Where an insulated wall separates a garage, patio, porch, or other unconditioned space from the conditioned space of the house, slab insulation shall also be installed at this interface to provide a thermal break between the conditioned and unconditioned slab. Where specific details cannot meet this requirement, partners shall provide the detail to EPA to request an exemption prior to the home's certification. EPA will compile exempted details and work with industry to develop feasible details for use in future revisions to the program. A list of currently exempted details is available at: [energystar.gov/slabeledge](http://energystar.gov/slabeledge).



# ENERGY STAR Single-Family New Homes

## National Rater Design Review Checklist, Version 3 / 3.1 / 3.2 (Rev. 13)

11. If pursuing Track A, then Item 4a.1 and 4a.2 shall be completed, even if the field verification tasks in ANSI / RESNET / ACCA / ICC 310 are not applicable to any HVAC systems in the home (e.g., a home with a boiler and no AC). Item 4a.3 shall be completed if the home to be certified contains an air conditioner or heat pump; otherwise, 'N/A' shall be checked.
12. As an alternative, the ENERGY STAR National HVAC Design Report may be collected in lieu of the ENERGY STAR National HVAC Design Supplement to Std. 310 for Dwellings & Units. In such cases, at least two documents will still be collected – an HVAC design report compliant with ANSI / RESNET / ACCA / ICC 310 plus the ENERGY STAR National HVAC Design Report. Note that for projects with more than one HVAC system, one ENERGY STAR National HVAC Design Report per system would need to be collected.
13. Raters' documentation of the HVAC contractor credential must be updated at least once every 12 months.
14. HVAC contractors must be credentialed by an EPA-recognized HVAC Quality Installation Training and Oversight Organization (H-QUITO) if a split air conditioner, unitary air conditioner, air-source heat pump, or water-source (i.e., geothermal) heat pump up to 65 kBtuh with a forced-air distribution system (i.e., ducts) or a furnace up to 225 kBtuh with a forced-air distribution system (i.e., ducts) will be installed in the home to be certified. For all other permutations of equipment (e.g., boilers, mini-split / multi-split systems) and distribution systems, a credential is not required. An explanation of this credentialing process and links to H-QUITOs, which maintain lists of credentialed contractors, can be found at [energystar.gov/newhomeshvac](http://energystar.gov/newhomeshvac).
15. If pursuing Track B, then Section 4b shall be fully completed if the home contains split air conditioners, unitary air conditioners, air-source heat pumps, or water-source (i.e., geothermal) heat pumps up to 65 kBtuh with forced-air distribution systems (i.e., ducts) or furnaces up to 225 kBtuh with forced-air distribution systems (i.e., ducts). For a home without any of these system types, collection of the National HVAC Design Report is still required with Section 1 and 2 completed. However, for such a home EPA recommends, but does not require, that Sections 3 through 5 of the report be completed and that the report be reviewed per Item 4b.2.
16. The Rater shall collect one National HVAC Design Report per system design per plan. Regardless of whether the "site-specific design" or "group design" box has been checked in Item 1.6 of the National HVAC Design Report, the system design as documented on the National HVAC Design Report must fall within the tolerances in Item 4b.2 for the home to be certified. The report is only required to be collected once per system design, even if multiple homes are built using this design (e.g., in a production environment where the same plan is built multiple times, only one report is required as long as no aspect of the system design changes between homes). The Rater is only responsible for verifying that the designer has not left any items blank on the National HVAC Design Report and for verifying the discrete objective parameters in Item 4b.2 of this Checklist, not for verifying the accuracy of every input on the National HVAC Design Report. Homes certified under Rev. 13 of the program requirements are permitted to use any Revision of the National HVAC Design Report between Rev. 08 and Rev. 13.
17. Visit [energystar.gov/hvacdesigntemps](http://energystar.gov/hvacdesigntemps) for the maximum cooling season design temperature and minimum heating season design temperature permitted for ENERGY STAR Single-Family New Homes and the process for a designer to obtain an allowance from EPA. The same design report is permitted to be used in other counties, as long as the design temperature limits in those other counties meet or exceed the cooling and heating season temperature limits for the county selected. For example, if Frederick County, VA, is used for the load calculations, with a 1% cooling temperature limit of 93 °F, then the same report could be used in Fairfax County (which has a higher limit of 94 °F) but not in Albemarle County (which has a lower limit of 92 °F).
18. To determine the number of occupants among all HVAC systems in the home, calculate the number of bedrooms, as defined below, and add one. The number of occupants used in loads must be within  $\pm 2$  of the home to be certified, unless Item 1.5 of the National HVAC Design Report indicates that the system is a cooling system for temporary occupant loads.

A bedroom is defined by ANSI / RESNET / ICC 301-2014 as a room or space 70 sq. ft. or greater size, with egress window and closet, used or intended to be used for sleeping. A "den", "library", or "home office" with a closet, egress window, and 70 sq. ft. or greater size or other similar rooms shall count as a bedroom, but living rooms and foyers shall not.

An egress window, as defined in 2009 IRC section R310, shall refer to any operable window that provides for a means of escape and access for rescue in the event of an emergency. The egress window definition has been summarized for convenience. The egress window shall:

  - have a sill height of not more than 44 inches above the floor; AND
  - have a minimum net clear opening of 5.7 sq. ft.; AND
  - have a minimum net clear opening height of 24 in.; AND
  - have a minimum net clear opening width of 20 in.; AND
  - be operational from the inside of the room without the use of keys, tools or special knowledge.
19. Conditioned Floor Area for the home to be certified shall be calculated in accordance with the definition in ANSI / RESNET / ICC 301-2019.
20. Window area for the home to be certified shall be calculated in accordance with the on-site inspection protocol provided in Normative Appendix B of ANSI / RESNET / ICC 301-2019.
21. "Predominant" is defined as the SHGC value used in the greatest amount of window area in the home.
22. Orientation represents the direction that the front door of the house is facing. The designer is only required to document the loads for the orientation(s) that the house might be built in. For example, if a house plan will only be built one time in a specific orientation (e.g., a site-specific design), then the designer only needs to document the loads for this one orientation.

This collection of information is approved by OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. (OMB Control No. 2060-0586). Responses to this collection of information are voluntary. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The public reporting and recordkeeping burden for this collection of information is estimated to be 0.5 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates and any suggested methods for minimizing respondent burden including through the use of automated collection techniques to the Director, Regulatory Support Division, U.S. Environmental Protection Agency (2821T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.



# ENERGY STAR Single-Family New Homes

## National Rater Field Checklist, Version 3 / 3.1 / 3.2 (Rev. 13)

Home Address: _____		City: _____		State: _____		Permit Date: _____	
<b>Thermal Enclosure System</b>		<b>Must Correct</b>	<b>Builder Verified<sup>1</sup></b>	<b>Rater Verified<sup>2</sup></b>	<b>N/A<sup>3</sup></b>		
<b>1. High-Performance Fenestration &amp; Insulation</b>							
1.1 Fenestration meets or exceeds specification in Item 2.1 of the National Rater Design Review Checklist.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-		
1.2 Insulation meets or exceeds specification in Item 3.1 of the National Rater Design Review Checklist.		<input type="checkbox"/>	Up to 10% <input type="checkbox"/>	<input type="checkbox"/>	-		
1.3 All insulation achieves Grade I install. per ANSI / RESNET / ICC 301. Alternatives in Footnote 4. <sup>4,5</sup>		<input type="checkbox"/>	Up to 10% <input type="checkbox"/>	<input type="checkbox"/>	-		
<b>2. Fully-Aligned Air Barriers<sup>6</sup></b> - 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). <sup>7,8</sup>							
2.1 Dropped ceilings / soffits below unconditioned attics, and all other ceilings.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
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. <sup>8,9</sup>							
2.2 Walls behind showers, tubs, staircases, and fireplaces.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2.3 Attic knee walls and skylight shaft walls. <sup>10</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2.4 Walls adjoining porch roofs or garages.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2.5 Double-walls and all other exterior walls.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-		
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 12 & 13. <sup>11,12,13</sup>							
2.6 Floors above garages, floors above unconditioned basements or crawlspaces, and cantilevered floors.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2.7 All other floors adjoining unconditioned space (e.g., rim / band joists at exterior wall or at porch roof).		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>3. Reduced Thermal Bridging</b>							
3.1 For insulated ceilings with attic space above (i.e., non-cathedralized), Grade I insulation extends to the inside face of the exterior wall below and is $\geq R-21$ in CZ 1-5; $\geq R-30$ in CZ 6-8. <sup>8,14</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3.2 For slabs on grade in CZ 4-8, 100% of slab edge insulated to $\geq R-5$ at the depth specified by the 2009 IECC and aligned with the thermal boundary of the walls. <sup>8,15,16</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3.3 Insulation beneath attic platforms (e.g., HVAC platforms, walkways) $\geq R-21$ in CZ 1-5; $\geq R-30$ in CZ 6-8. <sup>8</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3.4 At above-grade walls separating conditioned from unconditioned space, one of the following options used (rim / band joists exempted). <sup>17</sup>							
3.4.1 Continuous rigid insulation, insulated siding, or combination of the two is: $\geq R-3$ in CZ 1-4; $\geq R-5$ in CZ 5-8 <sup>8,18,19,20</sup> , <b>OR</b> ;		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3.4.2 Structural Insulated Panels <b>OR</b> ; Insulated Concrete Forms <b>OR</b> ; Double-wall framing <b>OR</b> ; <sup>18,21</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3.4.3 Advanced framing, including all of the Items below: <sup>22</sup>							
3.4.3a Corners insulated $\geq R-6$ to edge <sup>23</sup> , <b>AND</b> ;		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3.4.3b Headers above windows & doors insulated $\geq R-3$ for 2x4 framing or equivalent cavity width, and $\geq R-5$ for all other assemblies (e.g., with 2x6 framing) <sup>24</sup> , <b>AND</b> ;		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3.4.3c Framing limited at all windows & doors to one pair of king studs, plus one pair of jack studs per window opening to support the header and sill, <b>AND</b> ;		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3.4.3d Interior / exterior wall intersections insulated to same R-value as rest of exterior wall, <sup>25</sup> <b>AND</b> ;		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3.4.3e Minimum stud spacing of 16 in. o.c. for 2x4 framing in all Climate Zones and, in CZ 6-8, 24 in. o.c. for 2x6 framing. <sup>8,26</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>4. Air Sealing</b> (Unless otherwise noted below, "sealed" indicates the use of caulk, foam, or equivalent material)							
4.1 Ducts, flues, shafts, plumbing, piping, wiring, exhaust fans, & other penetrations to unconditioned space sealed, with blocking / flashing as needed.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-		
4.2 Recessed lighting fixtures adjacent to unconditioned space ICAT labeled and gasketed. Also, if in insulated ceiling without attic above, exterior surface of fixture insulated to $\geq R-10$ in CZ 4-8. <sup>8</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.3 Above-grade sill plates adjacent to conditioned space sealed to foundation or sub-floor. Gasket also placed beneath above-grade sill plate if resting atop concrete / masonry & adjacent to cond. space. <sup>27,28</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.4 Continuous top plate or blocking is at top of walls adjoining unconditioned space, and sealed.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.5 Drywall sealed to top plate at all unconditioned attic / wall interfaces using caulk, foam, drywall adhesive (but not other construction adhesives), or equivalent material. Either apply sealant directly between drywall and top plate or to the seam between the two from the attic above.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.6 Rough opening around windows & exterior doors sealed. <sup>29</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-		
4.7 Walls that separate attached garages from occupiable space sealed and, also, an air barrier installed and sealed at floor cavities aligned with these walls.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.8 In multifamily buildings, the gap between the common wall (e.g., the drywall shaft wall) and the structural framing between units sealed at all exterior boundaries.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.9 Doors adjacent to unconditioned space (e.g., attics, garages, basements) or ambient conditions made substantially air-tight with weatherstripping or equivalent gasket.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.10 Attic access panels, drop-down stairs, & whole-house fans equipped with durable $\geq R-10$ cover that is gasketed (i.e., not caulked). Fan covers either installed on house side or mechanically operated. <sup>30</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		





# ENERGY STAR Single-Family New Homes

## National Rater Field Checklist, Version 3 / 3.1 / 3.2 (Rev. 13)

HVAC System <sup>31</sup>				Must Correct	Rater Verified <sup>2</sup>	N/A <sup>3</sup>
5. Heating & Cooling Equipment - Complete Track A - HVAC Grading <sup>32</sup> or Track B - HVAC Credential <sup>33</sup>						
Track A	5a.1 Blower fan volumetric airflow is Grade I or II per ANSI / RESNET / ACCA / ICC 310.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5a.2 Blower fan watt draw is Grade I or II per ANSI / RESNET / ACCA / ICC 310.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5a.3 Refrigerant charge is Grade I per ANSI / RESNET / ACCA / ICC 310. See Footnote 34 for exemptions. <sup>34</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Track B	5b.1 HVAC manufacturer & model number on installed equipment matches either of the following (check box): <sup>35</sup> <input type="checkbox"/> National HVAC Design Report <input type="checkbox"/> Written approval received from designer			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5b.2 External static pressure measured by Rater at contractor-provided test locations and documented below: <sup>36</sup> Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure: _____ IWC			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5b.3 Permitted, but not required: National HVAC Commissioning Checklist collected, with no items left blank.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Duct Quality Installation (Applies to Heating, Cooling, Ventilation, Exhaust, & Pressure Balancing Ducts, Unless Noted in Footnote)						
6.1 Ductwork installed without kinks, sharp bends, compressions, or excessive coiled flexible ductwork. <sup>37</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2 Bedrooms pressure-balanced (e.g., using transfer grilles, jump ducts, dedicated return ducts, undercut doors) to achieve a Rater-measured pressure differential $\geq -3$ Pa and $\leq +3$ Pa with respect to the main body of the house when all air handlers are operating. Test configuration and an alternative compliance option in Footnote 38. <sup>38</sup>				<input type="checkbox"/>	<input type="checkbox"/>	-
6.3 All supply and return ducts in unconditioned space, including connections to trunk ducts, are insulated to $\geq R-6$ <sup>39</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4 Rater-measured total duct leakage meets one of the following two options. Alternative in Footnote 41: <sup>40, 41, 42</sup>						
6.4.1 Rough-in: The greater of $\leq 4$ CFM25 per 100 sq. ft. of CFA or $\leq 40$ CFM25, with air handler & all ducts, building cavities used as ducts, & duct boots installed. All duct boots sealed to finished surface, Rater-verified at final. <sup>43</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4.2 Final: The greater of $\leq 8$ CFM25 per 100 sq. ft. of CFA or $\leq 80$ CFM25, with the air handler & all ducts, building cavities used as ducts, duct boots, & register grilles atop the finished surface (e.g., drywall, floor) installed. <sup>44</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5 Rater-measured duct leakage to outdoors the greater of $\leq 4$ CFM25 per 100 sq. ft. of CFA or $\leq 40$ CFM25. <sup>40, 45</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Dwelling Unit Mechanical Ventilation Systems ("Vent System") <sup>46</sup> & Inlets in Return Duct <sup>47</sup>						
7.1 Rater-measured ventilation rate is within either $\pm 15$ CFM or $\pm 15\%$ of design report value. <sup>48</sup>				<input type="checkbox"/>	<input type="checkbox"/>	-
7.2 A readily-accessible 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). <sup>49</sup>				<input type="checkbox"/>	<input type="checkbox"/>	-
7.3 For any outdoor air inlet connected to a ducted return of the HVAC system (Complete if present; otherwise check "N/A"): <sup>47</sup>						<input type="checkbox"/>
7.3.1 Controls automatically restrict airflow using a motorized damper during vent. off-cycle and occupant override. <sup>50</sup>				<input type="checkbox"/>	<input type="checkbox"/>	-
7.3.2 Rater-measured vent. rate is $\leq 15$ CFM or 15% above design value at highest HVAC fan speed. Alt. in Fn. 51. <sup>51</sup>				<input type="checkbox"/>	<input type="checkbox"/>	-
7.4 System fan rated $\leq 3$ sones if intermittent and $\leq 1$ sone if continuous, or exempted. <sup>52</sup>				<input type="checkbox"/>	<input type="checkbox"/>	-
7.5 If Vent System controller operates the HVAC fan, then HVAC fan operation is intermittent and either the fan type is ECM / ICM or the controls will reduce the run-time by accounting for HVAC system heating or cooling hours. <sup>53</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6 Bathroom fans are ENERGY STAR certified if used as part of the Vent System. <sup>54</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.7 Air inlet location (Complete if ventilation air inlet location was specified on design report; otherwise check "N/A"): <sup>55, 56</sup>						<input type="checkbox"/>
7.7.1 Inlet pulls ventilation air directly from outdoors and not from attic, crawlspace, garage, or adjacent dwelling unit.				<input type="checkbox"/>	<input type="checkbox"/>	-
7.7.2 Inlet is $\geq 2$ ft. above grade or roof deck; $\geq 10$ ft. of stretched-string distance from known contamination sources not exiting the roof, and $\geq 3$ ft. distance from dryer exhausts and sources exiting the roof. <sup>57</sup>				<input type="checkbox"/>	<input type="checkbox"/>	-
7.7.3 Inlet is provided with rodent / insect screen with $\leq 0.5$ inch mesh.				<input type="checkbox"/>	<input type="checkbox"/>	-
8. Local Mechanical Exhaust – In each 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: <sup>48, 58</sup>						
Location		Continuous Rate	Intermittent Rate <sup>59</sup>			
8.1 Kitchen	Airflow	$\geq 5$ ACH, based on kitchen volume <sup>60, 61</sup>	$\geq 100$ CFM and, if not integrated with range, also $\geq 5$ ACH based on kitchen volume <sup>60, 61, 62</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
	Sound	Recommended: $\leq 1$ sone	Recommended: $\leq 3$ sones			
8.2 Bathroom	Airflow	$\geq 20$ CFM	$\geq 50$ CFM	<input type="checkbox"/>	<input type="checkbox"/>	-
	Sound	Required: $\leq 1$ sone	Recommended: $\leq 3$ sones			
9. Filtration						
9.1 MERV 6+ filter(s) installed in each ducted mech. system, designed so all return and mechanically supplied outdoor air passes through filter(s) prior to conditioning, and located to facilitate occupant access & regular service. <sup>63</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2 Filter access panel includes gasket and fits snugly against exposed edge of filter when closed to prevent bypass. <sup>64</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Combustion Appliances						
10.1 Furnaces, boilers, & water heaters are mechanically drafted or direct-vented. Alternatives in Footnote 67. <sup>65, 66, 67</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2 Fireplaces are mechanically drafted or direct-vented. Alternatives in Footnote 68. <sup>65, 66, 68</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.3 No unvented combustion appliances other than cooking ranges or ovens are located inside the home's pressure boundary. Alternative in Footnote 70. <sup>65, 69, 70</sup>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name: _____		Rater Pre-Drywall Inspection Date <sup>71</sup> : _____		Rater Initials: _____		
Rater Name: _____		Rater Final Inspection Date <sup>72</sup> : _____		Rater Initials: _____		
Builder Employee: _____		Builder Inspection Date: _____		Builder Initials: _____		



# ENERGY STAR Single-Family New Homes

## National Rater Field Checklist, Version 3 / 3.1 / 3.2 (Rev. 13)

### Footnotes

1. At the discretion of the Rater, the builder may verify up to eight items in Sections 1-4 of this Checklist. When this allowance is used for Item 1.2 or 1.3, a maximum of 10% of the total surface area of the non-adiabatic insulated assemblies are permitted to be builder-verified; the remainder must be verified by the Rater. When exercised, the builder's responsibility will be formally acknowledged by the builder 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.
2. All items shall be verified for each certified home and sampling protocols shall not be used. 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 or Approved Inspector, as defined by ANSI / RESNET / ICC 301, or an equivalent designation as determined by a Home Certification Organization (HCO); and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/newhomestraining](http://www.energystar.gov/newhomestraining).
3. The column titled "N/A," which denotes items that are "not applicable," should be used when the checklist Item is not present in the home or conflicts with local requirements.
4. 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  $\geq R-3$  in Climate Zones 1 to 4,  $\geq R-5$  in Climate Zones 5 to 8;<sup>8</sup> 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.
5. 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 that the home is being certified under, with approved exceptions listed at [www.energystar.gov/ERIEExceptions](http://www.energystar.gov/ERIEExceptions).
6. 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. EPA recommends, but does not require, rigid air barriers.  
Open-cell or closed-cell foam shall have a finished thickness  $\geq 5.5$  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  $\geq 1$  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  $\geq 6$  mil.
7. 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.
8. For all Versions except National v3.2, the 2009 IECC Climate Zone designations are applicable, as defined and illustrated in [Section R301](#) of the code. For National Version 3.2, 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.
9. 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 in multifamily dwellings; 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.<sup>8</sup> For the purpose of these exceptions, a basement or crawlspace is a space for which  $\geq 40\%$  of the total gross wall area is below-grade.
10. Exterior air barriers are not required for attic knee walls that are  $\leq 24$  in. in height if an interior air barrier is provided and insulation extends in all directions from the top of this interior air barrier into unconditioned space at the following levels: CZ 1-5:  $\geq R-21$ ; CZ 6-8:  $\geq R-30$ .<sup>8</sup>
11. EPA highly recommends, but does not require, an air barrier at the interior vertical surface of floor insulation in Climate Zones 4-8.<sup>8</sup>
12. 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.
13. 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.
14. The minimum designated R-values must be achieved regardless of the trade-offs determined using an equivalent U-factor or UA alternative calculation. Note that if the minimum designated values are used, then higher insulation values may be needed elsewhere to meet Item 1.2. Also, note that these requirements can be met by using any available strategy, such as a raised-heel truss, alternate framing that provides adequate space, and / or high-density insulation.
15. Slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of an interior, or exterior, slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall. The following alternatives apply:
  - a. Slab assemblies with an F-Factor equivalent to that of the insulation required in Item 3.2 may be used. F-Factors shall be determined using Table A6.3.1-1 from ASHRAE 90.1-2022 Appendix A. See [www.energystar.gov/F-Factor](http://www.energystar.gov/F-Factor) for more details.
  - b. The thermal break is permitted to be created using  $\geq R-3$  rigid insulation on top of the slab. In such cases, up to 10% of the slab surface is permitted to not be insulated (e.g., for sleepers, for sill plates). Insulation installed on top of slab shall be covered by a durable floor surface (e.g., hardwood, tile, carpet).
16. Where an insulated wall separates a garage, patio, porch, or other unconditioned space from the conditioned space of the house, slab insulation shall also be installed at this interface to provide a thermal break between the conditioned and unconditioned slab. Where specific details cannot





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meet this requirement, partners shall provide the detail to EPA to request an exemption prior to the home's certification. EPA will compile exempted details and work with industry to develop feasible details for use in future revisions to the program. A list of currently exempted details is available at: [energystar.gov/slabeledge](http://energystar.gov/slabeledge).

17. Mass walls utilized as the thermal mass component of a passive solar design (e.g., a Trombe wall) are exempt from this Item. 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: [energy.gov/sites/prod/files/guide\\_to\\_passive\\_solar\\_home\\_design.pdf](http://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 3.4 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  $\geq 50\%$  of the applicable assembly resistance, defined as the reciprocal of the mass wall equivalent U-factor in the 2009 IECC Table 402.1.3. 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 3.4 shall be checked.

18. Up to 10% of the total exterior wall surface area is exempted from the reduced thermal bridging requirements to accommodate intentional designed details (e.g., architectural details such as thermal fins, wing walls, or masonry fireplaces; structural details, such as steel columns). It shall be apparent to the Rater that the exempted areas are intentional 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 home.
19. 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 listed in Item 3.4.3 shall be met for those wall sections.
20. Steel framing shall meet the reduced thermal bridging requirements by complying with Item 3.4.1 of the Checklist.
21. Double-wall framing is defined as any framing method that ensures a continuous layer of insulation covering the studs to at least the R-value required in Item 3.4.1 of the Checklist, such as offset double-stud walls, aligned double-stud walls with continuous insulation between the adjacent stud faces, or single-stud walls with 2x2 or 2x3 cross-framing. In all cases, insulation shall fill the entire wall cavity from the interior to exterior sheathing except at windows, doors and other penetrations.
22. All advanced framing details shall be met except where the builder, architect, or engineer provides a framing plan that encompasses the details in question, indicating that structural members are required at these locations and including the rationale for these members (e.g., full-depth solid framing is required at wall corners or interior / exterior wall intersections for shear strength, a full-depth solid header is required above a window to transfer load to jacks studs, additional jack studs are required to support transferred loads, additional cripple studs are required to maintain on-center spacing, or stud spacing must be reduced to support multiple stories in a multifamily building). The Rater shall retain a copy of the detail and rationale for their records, but need not evaluate the rationale to certify the home.
23. All exterior corners shall be constructed to allow access for the installation of  $\geq R-6$  insulation that extends to the exterior wall sheathing. Examples of compliance options include standard-density insulation with alternative framing techniques, such as using three studs per corner, or high-density insulation (e.g., spray foam) with standard framing techniques.
24. Compliance options include continuous rigid insulation sheathing, SIP headers, other prefabricated insulated headers, single-member or two-member headers with insulation either in between or on one side, or an equivalent assembly. R-value requirement refers to manufacturer's nominal insulation value.
25. Insulation shall run behind interior / exterior wall intersections using ladder blocking, full length 2x6 or 1x6 furring behind the first partition stud, drywall clips, or other equivalent alternative.
26. In Climate Zones 6 – 8, a minimum stud spacing of 16 in. o.c. is permitted to be used with 2x6 framing if  $\geq R-20.0$  wall cavity insulation is achieved. However, all 2x6 framing with stud spacing of 16 in. o.c. in Climate Zones 6 – 8 shall have  $\geq R-20.0$  wall cavity insulation installed regardless of any framing plan or alternative equivalent total UA calculation.<sup>8</sup>
27. Existing sill plates (e.g., in a home undergoing a gut rehabilitation) on the interior side of structural masonry or monolithic walls are exempt from this Item. In addition, other existing sill plates resting atop concrete or masonry and adjacent to conditioned space are permitted, in lieu of using a gasket, to be sealed with caulk, foam, or equivalent material at both the interior seam between the sill plate and the subfloor and the seam between the top of the sill plate and the sheathing.
28. In Climate Zones 1 through 3, a continuous stucco cladding system adjacent to sill and bottom plates is permitted to be used in lieu of sealing plates to foundation or sub-floor with caulk, foam, or equivalent material.<sup>8</sup>
29. In Climate Zones 1 through 3, a continuous stucco cladding system sealed to windows and doors is permitted to be used in lieu of sealing rough openings with caulk or foam.<sup>8</sup>
30. Examples of durable covers include, but are not limited to, pre-fabricated covers with integral insulation, rigid foam adhered to cover with adhesive, or batt insulation mechanically fastened to the cover (e.g., using bolts, metal wire, or metal strapping).
31. This Checklist is designed to meet ASHRAE 62.2-2010 or later, and ANSI / ACCA's 5 QI-2015 protocol, thereby improving the performance of HVAC equipment in new homes when compared to homes 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 by occupants). Therefore, this Checklist is not a guarantee of proper ventilation, indoor air quality, or HVAC performance.
32. Track A – HVAC Grading shall use ANSI / RESNET / ACCA / ICC 310 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the schedule defined by the HCO that the home is being certified under.
33. For Track A, the Items in Section 5a are applicable to all unitary HVAC Systems including air conditioners and heat pumps up to 65 kBtu/h and furnaces up to 125 kBtu/h. All applicable systems shall comply with 5a.1 through 5a.3 for the home to be certified.
- For Track B, the Items in Section 5b are applicable to split air conditioners, unitary air conditioners, air-source heat pumps, and water-source (i.e., geothermal) heat pumps up to 65 kBtu/h with forced-air distribution systems (i.e., ducts) and to furnaces up to 225 kBtu/h with forced-air distribution systems (i.e., ducts). All applicable systems shall comply with 5b.1 and 5b.2 for the home to be certified.



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If, based on the selected Track, the Items in Section 5 are not applicable to any systems in the home, the Rater shall mark 'N/A'.

34. If the non-invasive procedure in ANSI / RESNET / ACCA / ICC 310 is not permitted to be used during the final inspection of a home (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 home 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 / ICC 310 may still be used to pursue a Grade I designation.
35. 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, if "N/A" was selected for Item 1.2 of the National Rater Design Review Checklist, then the Rater shall verify that all installed equipment is an exempted type per Footnote 14 of that Checklist or, if not an exempted type, shall re-review the National Rater Design Review Checklist to ensure compliance with all requirements (e.g., contractor credential, 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 after installation is complete.
36. 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 home.
37. 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.
38. 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. For an HVAC system with multiple zones, this requirement shall be verified with all zones calling for heating or cooling simultaneously; additional testing of individual zones is not required. When verifying this requirement, doors separating bedrooms from the main body of the house (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. As an alternative to the  $\pm 3$  Pa limit, a Rater-measured pressure differential  $\geq -5$  Pa and  $\leq +5$  Pa is permitted to be used for bedrooms with a design airflow  $\geq 150$  CFM. The Rater-measured pressure shall be rounded to the nearest whole number to assess compliance.
39. Item 6.3 does not apply to ducts that are a part of local mechanical exhaust and exhaust-only dwelling unit mechanical ventilation systems. 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.
40. Items 6.4 and 6.5 generally apply to the ducts of space heating, space cooling, and dwelling unit mechanical ventilation systems.
- However, visual inspection is permitted in lieu of testing for 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. 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 that the home is being certified under. Leakage limits shall be assessed on a per-system, rather than per-home, basis.
41. For a duct system with three or more returns, the total Rater-measured duct leakage is permitted to be the greater of  $\leq 6$  CFM25 per 100 sq. ft. of CFA or  $\leq 60$  CFM25 at 'rough-in' or the greater of  $\leq 12$  CFM25 per 100 sq. ft. of CFA or  $\leq 120$  CFM25 at 'final'.
42. Note that compliance with Item 6.4.1 or 6.4.2 in conjunction with Section 4a of the National Rater Design Review Checklist automatically achieves Grade I total duct leakage per ANSI / RESNET / ACCA / ICC 310.
43. 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.
44. 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.
45. Testing of duct leakage to the outdoors can be waived in accordance with the 2nd or 3rd alternative of ANSI / RESNET / ICC 301, Table 4.2.2 (1), footnote (w). Alternatively, testing of duct leakage to outdoors can be waived in accordance with Section 5.5.2 of ANSI / RESNET / ICC 380 if total duct leakage, at rough-in or final, is  $\leq 4$  CFM25 per 100 sq. ft. of conditioned floor area or 40 CFM25, whichever is larger. Guidance to assist partners with these alternatives, including modeling inputs, is available at <http://www.energystar.gov/newhomesguidance>.
46. 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.
47. Item 7.3 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.
48. The Dwelling Unit Mechanical Ventilation System 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 that the home is being certified under. 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.
49. For an attached dwelling unit, excluding units in dwellings (i.e., duplex) and townhomes, the override control is not required to be readily accessible to the occupant. However, in such cases, EPA recommends but does not require that the control be readily accessible to others (e.g., building maintenance staff) in lieu of the occupant.



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50. 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.
51. 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 that the home 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.
52. Dwelling Unit Mechanical Ventilation System fans shall be rated for sound at no less than the airflow rate in Item 2.3 of the National HVAC Design Report. Fans exempted from this requirement include HVAC air handler fans, remote-mounted fans, and intermittent fans rated  $\geq 400$  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  $\geq 4$  ft. ductwork between the fan and intake grill. 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.
53. Note that the 'fan-on' setting of a thermostat would not be an acceptable controller because it would continuously operate the HVAC fan.
54. Bathroom fans with a rated flow rate  $\geq 500$  CFM are exempted from the requirement to be ENERGY STAR certified.
55. Without proper maintenance, ventilation air inlet screens often become filled with debris. Therefore, EPA recommends, but does not require, that these ventilation air inlets be located so as to facilitate access and regular service by the occupant. Ventilation air inlets that are only visible via rooftop access are exempted from Item 7.7 and the Rater shall mark "N/A".
56. Two alternatives to the required 10 ft. distance are provided: 1) inlets providing outdoor air to a dwelling unit are permitted to be  $\geq 5$  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.
57. Known contamination sources include, but are not limited to, stacks, vents, exhausts, and vehicles.
58. 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.
59. 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.
60. 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  $\geq 25$  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.
61. Homes shall meet this Item. 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,  $\geq 6$  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 <http://www.energystar.gov/newhomesguidance>. As an alternative to Item 8.1, homes 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  $\leq 1.0$  ACH50 or  $\leq 0.05$  CFM50 per sq. ft. of Enclosure Area, and a Rater-verified dwelling unit compartmentalization rate  $\leq 0.30$  CFM50 per sq. ft. of Enclosure Area if multiple dwelling units are present in the building. 'Enclosure Area' is defined as the area of the surfaces that bound the volume being pressurized / depressurized during the test.
62. 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  $\geq 5$  ACH, based on the kitchen volume.
63. 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. While filters are recommended for mini-split systems, HRV's and ERV's, these systems, ducted or not, typically do not have MERV-rated filters available for use and are, therefore, also exempted under this version of the requirements. EPA also recommends, but does not require, filtering air inlets to minimize outdoor particles entering the home. HVAC filters located in the attic shall be considered accessible to the occupant 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  $\leq 12$  ft.
64. 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 grill.



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65. 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.
66. 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.
67. This item only applies to furnaces, boilers, and water heaters located within the home's pressure boundary. Naturally drafted equipment is allowed within the home's pressure boundary in Climate Zones 1-3 if the Rater has followed ANSI / ACCA 12 QH-2014, Section 3.2.2, Appendix A Sections A2.2.6, A3 (Carbon Monoxide Test), A4 (Depressurization Test for the Combustion Appliance Zone), and verified that the equipment meets the limits defined within.<sup>8</sup>
68. This item only applies to fireplaces located within the home's pressure boundary. Naturally drafted fireplaces are allowed within the home's pressure boundary if the Rater has verified that the total net rated exhaust flow of the two largest exhaust fans (excluding summer cooling fans) is  $\leq 15$  CFM per 100 sq. ft. of occupiable space when at full capacity. If the net exhaust flow exceeds the allowable limit, it shall be reduced or compensating outdoor airflow provided. Per ASHRAE 62.2-2010, the term "net rated exhaust flow" is defined as flow through an exhaust fan minus the compensating outdoor airflow through any supply fan that is interlocked to the exhaust fan. Per ASHRAE 62.2-2010, the term "occupiable space" is defined as any enclosed space inside the pressure boundary and intended for human activities, including, but not limited to, all habitable spaces, toilets, closets, halls, storage and utility areas, and laundry areas. See Footnote 52 for the definition of "habitable spaces".
69. The minimum volume of combustion air required for safe operation by the manufacturer and / or code shall be met or exceeded. Also, in accordance with the National Fuel Gas Code, ANSI Z223.1 / NFPA54, unvented room heaters shall not be installed in bathrooms or bedrooms.
70. Alternatively, unvented combustion appliances other than cooking ranges or ovens are permitted to be located inside the home's pressure boundary if the Rater has followed ANSI/ACCA 12 QH-2014, Section 3.2.2, Appendix A Sections A2.2.6, A3, and A4, and verified the equipment meets the limits defined within.
71. 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 home that has missed the pre-drywall inspection. Additional information is available in the [Technical Bulletin: Pre-Drywall Inspection Is Always Required](#).
72. 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.

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## National HVAC Design Report, Version 3 / 3.1 / 3.2 (Rev. 13) <sup>1</sup>

### HVAC Designer Responsibilities:

- Complete one National HVAC Design Report for each system design for a house plan, created for either the specific plan configuration (i.e., elevation, option, orientation, & county) of the home to be certified or for a plan that is intended to be built with different configurations (i.e., different elevations, options, and/or orientations). Visit [www.energystar.gov/newhomeshvacdesign](http://www.energystar.gov/newhomeshvacdesign) and see Footnote 2 for more information. <sup>2</sup>
- Obtain efficiency features (e.g., window performance, insulation levels, and infiltration rate) from the builder or Rater. <sup>3</sup>
- Provide the completed National HVAC Design Report to the builder or credentialed HVAC contractor and to the Rater.

### 1. Design Overview

1.1 Designer name: \_\_\_\_\_ Designer company: \_\_\_\_\_ Date: \_\_\_\_\_

1.2 Select which party you are providing these design services to: ☐ Builder or ☐ Credentialed HVAC contractor

1.3 Name of company you are providing these design services to (if different than Item 1.1): \_\_\_\_\_

1.4 Area that system serves: ☐ Whole-house ☐ Upper-level ☐ Lower-level ☐ Other \_\_\_\_\_

1.5 Is cooling system for a temporary occupant load? <sup>4</sup> ☐ Yes ☐ No

1.6 House plan: \_\_\_\_\_ Check box to indicate whether the system design is site-specific or part of a group: <sup>2</sup>

☐ Site-specific design. Option(s) & elevation(s) modeled: \_\_\_\_\_

☐ Group design. Group #: \_\_\_\_\_ out of \_\_\_\_\_ total groups for this house plan. Configuration modeled: \_\_\_\_\_

### 2. Dwelling Unit Mechanical Ventilation System Design ("Vent System") <sup>5, 6, 7</sup> & Inlets in Return Duct <sup>8</sup>

Designer  
Verified

#### Airflow:

2.1 Ventilation airflow design rate & run-time meet the requirements of ASHRAE 62.2-2010 or later. <sup>9</sup>	<input type="checkbox"/>
2.2 Ventilation airflow rate required by 62.2 for a continuous system: _____ CFM	-
2.3 Design for this system: Vent. airflow rate: _____ CFM Run-time per cycle: _____ minutes Cycle time: _____ minutes	-

#### System Type & Controls:

2.4 Specified system type: <input type="checkbox"/> Supply <input type="checkbox"/> Exhaust <input type="checkbox"/> Balanced	-
2.5 Specified control location: _____ (e.g., Master bath, utility room)	-
2.6 Specified controls allow the system to operate automatically, without occupant intervention.	<input type="checkbox"/>
2.7 Specified controls include a readily-accessible ventilation override and a label has also been specified 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).	<input type="checkbox"/>
2.8 For any outdoor air inlet designed to connect to a ducted return of the HVAC system, specified controls automatically restrict airflow using a motorized damper during ventilation off-cycle and occupant override. <sup>8, 10</sup>	<input type="checkbox"/>

Sound: 2.9 The fan of the specified system is rated $\leq 3$ sones if intermittent and $\leq 1$ sone if continuous, or exempted. <sup>11</sup>	<input type="checkbox"/>
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#### Efficiency:

2.10 If Vent System controller operates the HVAC fan, then HVAC fan operation is intermittent and either the fan type in Item 4.7 is ECM / ICM or the controls will reduce the run-time by accounting for HVAC system heating or cooling hours. <sup>12</sup>	<input type="checkbox"/>
2.11 If bathroom fans are specified as part of the system, then they are ENERGY STAR certified. <sup>13</sup>	<input type="checkbox"/>

#### Air Inlet Location: (Complete this section if system has a specified air inlet location; otherwise check "N/A"). <sup>14</sup>

☐ N/A

2.12 Inlet pulls ventilation air directly from outdoors and not from attic, crawlspace, garage, or adjacent dwelling unit.	<input type="checkbox"/>
2.13 Inlet is $\geq 2$ ft. above grade or roof deck; $\geq 10$ ft. of stretched-string distance from known contamination sources (e.g., stack, vent, exhaust, vehicles) not exiting the roof, and $\geq 3$ ft. from known sources exiting the roof. <sup>15</sup>	<input type="checkbox"/>

### 3. Room-by-Room Heating & Cooling Loads <sup>16</sup>

3.1 Room-by-room loads calculated using: <input type="checkbox"/> Unabridged ACCA Manual J v8 <input type="checkbox"/> 2013 ASHRAE Fundamentals <input type="checkbox"/> Other per AHJ <sup>17</sup>	-
3.2 Indoor design temperatures used in loads are 70°F for heating and 75°F for cooling.	<input type="checkbox"/>
3.3 Outdoor design temperatures used in loads: (See Footnote 18 and <a href="http://www.energystar.gov/hvacdesigntemps">www.energystar.gov/hvacdesigntemps</a> ) <sup>18</sup> County & State, or US Territory, selected: _____ Cooling season: _____ °F Heating season: _____ °F	-
3.4 Number of occupants used in loads: <sup>19</sup> _____	-
3.5 Conditioned floor area used in loads: <sup>20</sup> _____ Sq. Ft.	-
3.6 Window area used in loads: <sup>21</sup> _____ Sq. Ft.	-
3.7 Predominant window SHGC used in loads: <sup>22</sup> _____	-
3.8 Infiltration rate used in loads: <sup>23</sup> Summer: _____ Winter: _____	-
3.9 Mechanical ventilation rate used in loads: _____ CFM	-
<b>Loads At Design Conditions (kBtuh)</b>	
	<b>N</b> <b>NE</b> <b>E</b> <b>SE</b> <b>S</b> <b>SW</b> <b>W</b> <b>NW</b>
Cooling 3.10 Sensible heat gain (By orientation <sup>24</sup> ):	-
3.11 Latent heat gain (Not by orientation):	-
3.12 Total heat gain (By orientation <sup>24</sup> ):	-
3.13 Maximum – minimum total heat gain (Item 3.12) across orientations = _____ kBtuh Variation is $\leq 6$ kBtuh. <sup>24, 25</sup>	<input type="checkbox"/>
Heating 3.14 Total heat loss (Not by orientation):	-



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4. Heating & Cooling Equipment Selection <sup>16</sup>						Designer Verified	
4.1 Equipment selected per ACCA Manual S (see Footnote 26 & 27). <sup>26, 27</sup>						<input type="checkbox"/>	
<b>Air Conditioner / Heat Pump</b> (Complete if air conditioner or heat pump will be installed; otherwise check "N/A")						<input type="checkbox"/> N/A	
4.2 Equipment type: <input type="checkbox"/> Cooling-only air conditioner or <input type="checkbox"/> Cooling & heating heat pump						-	
4.3 Condenser manufacturer & model: _____						-	
4.4 Evaporator / fan coil manufacturer & model: _____						-	
4.5 AHRI reference #: <sup>28</sup> _____						-	
4.6 Rated cooling efficiency: <sup>29</sup> _____ / _____ Rated heating efficiency: <sup>30</sup> _____						-	
4.7 Evaporator fan type: <input type="checkbox"/> PSC <input type="checkbox"/> ECM / ICM <input type="checkbox"/> Other: _____						-	
4.8 Compressor type: <input type="checkbox"/> Single-speed <input type="checkbox"/> Two-speed <input type="checkbox"/> Variable-speed						-	
4.9 Latent capacity at design conditions, from OEM expanded performance data: <sup>31</sup> _____ kBtuh						-	
4.10 Sensible capacity at design conditions, from OEM expanded performance data: <sup>31</sup> _____ kBtuh						-	
4.11 Total capacity at design conditions, from OEM expanded performance data: <sup>31</sup> _____ kBtuh						-	
4.12 Air-source heat pump capacity: At 17°F: _____ kBtuh At 47°F: _____ kBtuh <input type="checkbox"/> N/A						-	
4.13 Cooling sizing % = Total capacity (Item 4.11) divided by maximum total heat gain (Item 3.12): _____ %						-	
4.14 Complete this Item if Condition B Climate will be used to select sizing limit in Item 4.15. Otherwise, check "N/A": <sup>32</sup> <input type="checkbox"/> N/A						-	
4.14.1 Load sensible heat ratio = Max. sensible heat gain (Item 3.10) / Max. total heat gain (Item 3.12) = _____ %							
4.14.2 HDD / CDD ratio (Visit <a href="http://www.energystar.gov/hvacdesigntemps">www.energystar.gov/hvacdesigntemps</a> to determine this value for the design location) = _____							
4.15 Check box of applicable cooling sizing limit from chart below: <sup>26, 27</sup>						-	
Equipment Type (Per Item 4.2) & Climate Condition (Per Item 4.14)		Compressor Type (Per Item 4.8)					
		Single-Speed	Two-Speed	Variable-Speed			
For Cooling-Only Equipment or For Cooling Mode of Heat Pump in Condition A Climate		<input type="checkbox"/> Recommended: 90 – 115% Allowed: 90 – 130%	<input type="checkbox"/> Recommended: 90 – 120% Allowed: 90 – 140%	<input type="checkbox"/> Recommended: 90 – 130% Allowed: 90 – 160%			
For Cooling Mode of Heat Pump in Condition B Climate		<input type="checkbox"/> 90% - 100%, plus 15 kBtuh	<input type="checkbox"/> 90% - 100%, plus 15 kBtuh	<input type="checkbox"/> 90% - 100%, plus 15 kBtuh			
4.16 Cooling sizing % (4.13) is within cooling sizing limit (4.15).						<input type="checkbox"/>	
<b>Furnace</b> (Complete if furnace will be installed; otherwise check "N/A").						<input type="checkbox"/> N/A	
4.17 Furnace manufacturer & model: _____						-	
4.18 Rated heating efficiency: _____ AFUE						-	
4.19 Total capacity: <sup>33</sup> _____ kBtuh						-	
4.20 Heating sizing % = Total capacity (Item 4.19) divided by total heat loss (Item 3.14): _____ %						-	
4.21 Check box of applicable heating sizing limit from chart below:						-	
When Used for Heating Only		When Paired With Cooling					
<input type="checkbox"/> 100 – 140%		<input type="checkbox"/> Recommended: 100 – 140% Allowed: 100 – 400%					
4.22 Heating sizing % (4.20) is within heating sizing limit (4.21).						<input type="checkbox"/>	
<b>5. Duct Design</b> (Complete if heating or cooling equipment will be installed with ducts; otherwise check "N/A"). <sup>16</sup>						<input type="checkbox"/> N/A	
5.1 Duct system designed for the equipment selected in Section 4, per ACCA Manual D.						<input type="checkbox"/>	
5.2 Design HVAC fan airflow: <sup>34</sup> _____ Cooling mode _____ CFM Heating mode _____ CFM						-	
5.3 Design HVAC fan speed setting (e.g., low, medium, high): <sup>35</sup> _____ Cooling mode _____ Heating mode _____						-	
5.4 Design total external static pressure (corresponding to the mode with the higher airflow in Item 5.2): <sup>36</sup> _____ IWC						-	
5.5 Room-by-room design airflows documented below (which must sum to the mode with the higher airflow in Item 5.2): <sup>37, 38</sup>						-	
Room Name	Design Airflow (CFM)	Room Name	Design Airflow (CFM)	Room Name	Design Airflow (CFM)		
1		12		23			
2		13		24			
3		14		25			
4		15		26			
5		16		27			
6		17		28			
7		18		29			
8		19		30			
9		20		31			
10		21		32			
11		22		Total for all rooms			



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### Footnotes

1. This report is designed to meet ASHRAE 62.2-2010 or later and ANSI / ACCA's 5 QI-2015 protocol, thereby improving the performance of HVAC equipment in new homes when compared to homes 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 occupant behavior). Therefore, system designs documented through the use of this report are not a guarantee of proper ventilation, indoor air quality, or HVAC performance.

This report applies 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). For all other permutations of equipment (e.g., boilers, mini-split / multi-split systems) and distribution systems, Section 1 and 2 are required and Sections 3 through 5 are recommended, but not required.

2. The report shall represent a single system design for a house plan. Check the box for "site-specific design" if the design was created for the specific plan configuration (i.e., elevation, option, orientation, and county) of the home to be certified. Check the box for "group design" if the design was created for a plan that is intended to be built with potentially different configurations (i.e., different elevations, options, and/or orientations). Regardless of the box checked, the system design as documented on this National HVAC Design Report must fall within the following tolerances for the home to be certified:

- Item 3.3: The outdoor design temperature used in loads are within the limits defined at [www.energystar.gov/hvacdesigntemps](http://www.energystar.gov/hvacdesigntemps).
- Item 3.4: The number of occupants used in loads is within  $\pm 2$  of the home to be certified.
- Item 3.5: The conditioned floor area used in loads is between 100 sq. ft. smaller and 300 sq. ft. larger than the home to be certified.
- Item 3.6: The window area used in loads is between 15 sq. ft. smaller and 60 sq. ft. larger than the home to be certified, or, for homes to be certified with >500 sq. ft. of window area, between 3% smaller and 12% larger.
- Item 3.7: The predominant window SHGC is within 0.1 of the predominant value in the home to be certified.
- Items 3.10 - 3.12: The sensible, latent, & total heat gain are documented for the orientation of the home to be certified.
- Item 3.13: The variation in total heat gain across orientations is  $\leq 6$  kBtuh.
- Item 4.16: The cooling sizing % is within the cooling sizing limit selected.

Provide the National HVAC Design Report to the party you are providing these design services to (i.e., a builder or credentialed HVAC contractor) and to the Rater. The report is only required to be provided once per system design, even if multiple homes are built using this design (e.g., in a production environment where the same plan is built multiple times, only one report is required). As long as a report has been provided that falls within these tolerances for the home to be certified, no additional work is required. However, if no report falls within these tolerances or if any aspect of the system design changes, then an additional report will need to be generated prior to certification. Homes certified under Rev. 13 of the program requirements are permitted to use any Revision of the National HVAC Design Report between Rev. 08 and Rev. 13. Visit [www.energystar.gov/newhomeshvacdesign](http://www.energystar.gov/newhomeshvacdesign) for a tool to assist with group designs and for more information.

3. 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 or Approved Inspector, as defined by ANSI / RESNET / ICC 301, or an equivalent designation as determined by a Home Certification Organization (HCO); and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/newhomestraining](http://www.energystar.gov/newhomestraining).
4. Check "Yes" if this system is to handle temporary occupant loads. Such a system may be required to accommodate a significant number of guests on a regular or sporadic basis and shall be handled by a supplemental cooling system (e.g., a small, single-package unit or split-coil unit) or by a system that can shift capacity from zone to zone (e.g., a variable volume system).
5. 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.
6. The system shall have at least one supply or exhaust fan with associated ducts and controls. Local exhaust fans are allowed to be part of a Dwelling Unit Mechanical Ventilation System. Designers may provide supplemental documentation as needed to document the system design. For example, for Item 2.3, 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 will be required to 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 then must fall within the program-specified tolerance relative to that design ventilation rate.
7. In "Warm-Humid" climates as defined by 2009 IECC Figure 301.1 (i.e., CZ 1 and portions of CZ 2 and 3A below the white line), it is recommended, but not required, that equipment be specified with sufficient latent capacity to maintain indoor relative humidity at  $\leq 60\%$ .
8. Item 2.8 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. 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. Note that a Rater will generally measure the ventilation rate at the highest HVAC fan speed applicable to ventilation mode (e.g., if the inlet only opens when the HVAC is in 'fan-only' mode, it will be tested in this mode) to verify that it is  $\leq 15$  CFM or 15% above design value. 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.
9. Airflow design rates and run-times shall be determined using ASHRAE 62.2-2010 or later. Designers are permitted, but not required, to use published addenda and/or more recent editions of the standard to assess compliance.
10. In addition, consult manufacturer requirements to ensure return air temperature requirements are met.
11. Dwelling Unit Mechanical Ventilation System fans shall be rated for sound at no less than the airflow rate in Item 2.3. Fans exempted from this requirement include HVAC air handler fans, remote-mounted fans, and intermittent fans rated  $\geq 400$  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  $\geq 4$  ft. ductwork between the fan and intake grill. Per ASHRAE 62.2-2010, habitable spaces are intended for continual human occupancy; such space generally



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includes areas used for living, sleeping, dining, and cooking but does not generally include bathrooms, toilets, hallways, storage areas, closets, or utility rooms.

12. Note that the 'fan-on' setting of a thermostat would not be an acceptable controller because it would continuously operate the HVAC fan.
13. Bathroom fans with a rated flow rate  $\geq 500$  CFM are exempted from the requirement to be ENERGY STAR certified.
14. Without proper maintenance, ventilation air inlet screens often become filled with debris. Therefore, EPA recommends, but does not require, that these ventilation air inlets be located so as to facilitate access and regular service by the occupant.
15. Two alternatives to the required 10 ft. distance are provided: 1) inlets providing outdoor air to a dwelling unit are permitted to be  $\geq 5$  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.
16. Homes certified through the Caribbean Program Requirements, Version 3, or a home with  $\leq 50\%$  air-conditioned occupiable space certified through the Pacific Program Requirements, Version 3.2, are exempt from completing Sections 3, 4, and 5 of this report.
17. Select "2013 ASHRAE Fundamentals" if using Chapter 17 of the 2013 ASHRAE Handbook of Fundamentals. Select "Other per AHJ" if the Authority Having Jurisdiction where the home will be certified mandates the use of a load calculation methodology other than Unabridged ACCA Manual J v8 or 2013 ASHRAE Fundamentals.
18. Visit [www.energystar.gov/hvacdesigntemps](http://www.energystar.gov/hvacdesigntemps) for the maximum cooling season design temperature and minimum heating season design temperature permitted for ENERGY STAR Single-Family New Homes. For "County & State, or US Territory, selected", select the County and State or US Territory (i.e., Guam, Northern Mariana Islands, Puerto Rico, or US Virgin Islands), where the home is to be certified. The same design report is permitted to be used in other counties, as long as the design temperature limits in those other counties meet or exceed the cooling and heating season temperature limits for the county selected. For example, if Frederick County, VA, is used for the load calculations, with a 1% cooling temperature limit of 93 °F, then the same report could be used in Fairfax County (which has a higher limit of 94 °F) but not in Albemarle County (which has a lower limit of 92 °F). If a jurisdiction-specified design temperature is used that exceeds the limit in the Design Temperature Limit Reference Guide, designers must submit a Design Temperature Exception Request available at [www.energystar.gov/hvacdesigntemps](http://www.energystar.gov/hvacdesigntemps).
19. To determine the number of occupants among all HVAC systems in the home, calculate the number of bedrooms, as defined below, and add one. This number of occupants must be within  $\pm 2$  of the home to be certified, unless Item 1.5 indicates that the system is a cooling system for temporary occupant loads.

A bedroom is defined by ANSI / RESNET / ICC 301-2014 as a room or space 70 sq. ft. or greater size, with egress window and closet, used or intended to be used for sleeping. A "den", "library", or "home office" with a closet, egress window, and 70 sq. ft. or greater size or other similar rooms shall count as a bedroom, but living rooms and foyers shall not.

An egress window, as defined in 2009 IRC section R310, shall refer to any operable window that provides for a means of escape and access for rescue in the event of an emergency. The egress window definition has been summarized for convenience. The egress window shall:

  - have a sill height of not more than 44 inches above the floor; AND
  - have a minimum net clear opening of 5.7 sq. ft., height of 24 in., and width of 20 in.; AND
  - be operational from the inside of the room without the use of keys, tools or special knowledge.
20. The difference between the Conditioned Floor Area (CFA) used in the design and the actual home to be certified must fall within the tolerance specified in Footnote 2, as verified by a Rater. Be advised, the Rater will calculate CFA using the definition in ANSI / RESNET / ICC 301-2019, which defines this value, in part, as the floor area of the Conditioned Space Volume within a building or Dwelling Unit, not including the floor area of attics, crawlspaces, and basements below air sealed and insulated floors. See <https://codes.iccsafe.org/content/RESNET3012019P1/3-definitions-> for the complete definition.
21. The difference between the window area used in the design and the actual home to be certified must fall within the tolerance specified in Footnote 2, as verified by a Rater. Be advised, the Rater will calculate window area using the on-site inspection protocol provided in Normative Appendix B of ANSI / RESNET / ICC 301-2019, which instructs the Rater to measure the width and height of the rough opening for the window and round to the nearest inch, and then to use these measurements to calculate window area, rounding to the nearest tenth of a square foot. See <https://codes.iccsafe.org/content/RESNET3012019P1/normative-appendix-b-inspection-procedures-for-minimum-rated-features> for the complete protocol.
22. "Predominant" is defined as the SHGC value used in the greatest amount of window area in the home.
23. Infiltration rate shall reflect the value used in the confirmed or projected ERI rating for home to be certified. Alternatively, use "Average" or "Semi-loose" values for the cooling season infiltration rate and "Semi-tight" or "Average" values for the heating season infiltration rate, as defined by ACCA Manual J, Eighth Edition, Version Two.
24. Orientation represents the direction that the front door of the house is facing. The designer is only required to document the loads for the orientation(s) that the house might be built in. For example, if a house plan will only be built one time in a specific orientation (e.g., a site-specific design), then the designer only needs to document the loads for this one orientation.
25. Determine the orientation with the largest and smallest Total Heat Gain. Verify that the difference in Total Heat Gain between the orientation with the largest and smallest value is  $\leq 6$  kBtuh. If not, then assign the orientations into one or more groups until the difference is  $\leq 6$  kBtuh and then complete a separate National HVAC Design Report for each group.
26. Equipment shall be selected using the maximum total heat gain in Item 3.12 and the total heat loss in Item 3.14 per ACCA Manual S, Second Edition, except that cooling ranges above ACCA Manual S limits are temporarily allowed, per Item 4.15.
27. As an alternative for low-load spaces, a system match-up including a single-speed compressor with a total capacity  $\leq 20$  kBtuh is permitted to be used in spaces with a total cooling load  $\leq 15$  kBtuh. A system match-up including a two-speed or variable-speed compressor with a total capacity  $\leq 25$  kBtuh is permitted to be used in spaces with a total cooling load  $\leq 18$  kBtuh.





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28. If the equipment contains multiple components, the AHRI Reference # shall represent the rated efficiency of the specific combination of indoor and outdoor components. EPA recommends, but does not require, that the rating also encompass the furnace when such a rating is available. If an AHRI Reference # is not available, OEM-provided documentation shall be attached with the rated efficiency of the specific combination of indoor & outdoor components of the air conditioner or heat pump, along with confirmation that the components are designed to be used together.
29. For example, if the metric for the rated efficiency is SEER, SEER2, EER, or EER2, then its SEER, SEER2, EER, or EER2 rating shall be reported. If both SEER and EER (or SEER2 and EER2) are available, then both values shall be reported. When ratings are available using both AHRI 210/240-2017 (e.g., SEER) and -2023 (SEER2), then only the former (e.g., SEER) need be reported.
30. For example, if the metric for the rated efficiency is HSPF, HSPF2, or COP, then its HSPF, HSPF2, or COP rating shall be reported. When ratings are available using both AHRI 210/240-2017 (e.g., HSPF) and -2023 (HSPF2), then only the former (e.g., HSPF) need be reported.
31. The full system capacity at design conditions, from OEM expanded performance data, shall be listed. For two-speed equipment, the full system capacity shall reflect the capacity at the maximum available compressor speed. For variable-speed equipment, it shall reflect the capacity when the compressor operates at the AHRI rating speed.
32. Per ACCA Manual S, Second Edition, if the load sensible heat ratio is  $\geq 95\%$  and the HDD/CDD ratio is  $\geq 2.0$ , then the Climate is Condition B, otherwise it is Condition A.
33. The full system capacity shall be listed. For two-stage and modulating furnaces, the full system capacity shall reflect the maximum output available.
34. Design HVAC fan airflow is the design airflow for the blower in CFM, as determined using the manufacturer's expanded performance data.
35. Design HVAC fan speed setting is the setting on the control board (e.g., low, medium, high) corresponding to the Design HVAC fan airflow.
36. Design total external static pressure is the pressure corresponding to the Design HVAC fan airflow, inclusive of external components (e.g., evaporator coil, whole-house humidifier, or  $\geq$  MERV 6 filter).
37. Designers may provide supplemental documentation with room-by-room and total design airflows in lieu of completing Item 5.5. Sample supplemental documentation can be found at [www.energystar.gov/newhomeshvacdesign](http://www.energystar.gov/newhomeshvacdesign).
38. Orientation-specific room-by-room design airflows are recommended, but not required, to distribute airflow proportional to load, thereby improving comfort and efficiency.

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## National HVAC Commissioning Checklist, Version 3 / 3.1 / 3.2 (Rev. 13) <sup>1, 2</sup>

### HVAC Commissioning Contractor Responsibilities:

- The commissioning contractor must be credentialed by an HVAC oversight organization to complete this checklist. One checklist must be completed and signed by the commissioning contractor for each HVAC system that is commissioned.
- The completed checklist for each commissioned system, along with the corresponding National HVAC Design Report, shall be retained by the contractor for a minimum of three years for quality assurance purposes. Furthermore, the contractor shall provide the completed checklist to the builder, the Rater <sup>3</sup> responsible for certifying the home, and the HVAC oversight organization upon request.
- Visit [www.energystar.gov/newhomeshvac](http://www.energystar.gov/newhomeshvac) for information about the credential requirement and this checklist.

### 1. Commissioning Overview

1.1 Contractor name _____	Contractor company _____	Date _____	
1.2 Organization that your company is credentialed with:	<input type="checkbox"/> ACCA	<input type="checkbox"/> Advanced Energy	<input type="checkbox"/> NYSERDA
1.3 Builder client name: _____			
1.4 Home address: _____	City: _____	State: _____ Zip code: _____	
1.5 National HVAC Design Report corresponding to this system has been collected from designer or builder. <input type="checkbox"/> Contractor-verified			
1.6 Area that system serves, per Item 1.4 of National HVAC Design Report: <input type="checkbox"/> Whole-house <input type="checkbox"/> Upper-level <input type="checkbox"/> Lower-level <input type="checkbox"/> Other _____			
1.7 House plan, per Item 1.6 of National HVAC Design Report: _____ <input type="checkbox"/> Site-specific design <input type="checkbox"/> Group design #: _____			

**2. Refrigerant Charge** - Run system for 15 minutes before testing. If outdoor ambient temperature at the condenser is  $\leq 55^{\circ}\text{F}$  or, if known, below the manufacturer-recommended minimum operating temperature for the cooling cycle, then the system shall include a TXV, the outdoor temperature shall be recorded in Item 2.1, and the contractor shall check "N/A" in this Section. <sup>4</sup> Ducted or non-ducted single-packaged systems (i.e., PTAC) are exempt from this section.

	Contractor Verified	N/A
2.1 Outdoor ambient temperature at condenser: _____ $^{\circ}\text{F}$ DB	-	-
2.2 Return-side air temperature inside duct near evaporator, during cooling mode: _____ $^{\circ}\text{F}$ WB	-	<input type="checkbox"/>
2.3 Liquid line pressure: _____ psig	-	<input type="checkbox"/>
2.4 Liquid line temperature: _____ $^{\circ}\text{F}$ DB	-	<input type="checkbox"/>
2.5 Suction line pressure: _____ psig	-	<input type="checkbox"/>
2.6 Suction line temperature: _____ $^{\circ}\text{F}$ DB	-	<input type="checkbox"/>

For System with Thermal Expansion Valve (TXV):

2.7 Condenser saturation temperature: _____ $^{\circ}\text{F}$ DB (Using Item 2.3)	-	<input type="checkbox"/>
2.8 Subcooling value: _____ $^{\circ}\text{F}$ DB (Item 2.7 - Item 2.4)	-	<input type="checkbox"/>
2.9 OEM subcooling goal: _____ $^{\circ}\text{F}$ DB	-	<input type="checkbox"/>
2.10 Subcooling deviation: _____ $^{\circ}\text{F}$ DB (Item 2.8 – Item 2.9)	-	<input type="checkbox"/>

For System with Fixed Orifice:

2.11 Evaporator saturation temperature: _____ $^{\circ}\text{F}$ DB (Using Item 2.5)	-	<input type="checkbox"/>
2.12 Superheat value: _____ $^{\circ}\text{F}$ DB (Item 2.6 – Item 2.11)	-	<input type="checkbox"/>
2.13 OEM superheat goal: _____ $^{\circ}\text{F}$ DB (Using superheat tables and Items 2.1 & 2.2)	-	<input type="checkbox"/>
2.14 Superheat deviation: _____ $^{\circ}\text{F}$ DB (Item 2.12 – Item 2.13)	-	<input type="checkbox"/>

2.15 Item 2.10 is  $\pm 3^{\circ}\text{F}$  or Item 2.14 is  $\pm 5^{\circ}\text{F}$

2.16 An OEM test procedure (e.g., as defined for a ground-source heat pump) has been used in place of the sub-cooling or super-heat process and documentation has been attached that defines this procedure.	<input type="checkbox"/>	<input type="checkbox"/>
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### 3. Indoor HVAC Fan Airflow

3.1 The mode with the higher design HVAC fan airflow used, per Item 5.2 of National HVAC Design Report: <input type="checkbox"/> Heating <input type="checkbox"/> Cooling	<input type="checkbox"/>	-
3.2 Static pressure test holes have been created, and test hole locations are well-marked and accessible.	<input type="checkbox"/>	-
Test hole location for <b>return</b> external static pressure: <input type="checkbox"/> Plenum <input type="checkbox"/> Cabinet <input type="checkbox"/> Transition <input type="checkbox"/> Other: _____	-	-
Test hole location for <b>supply</b> external static pressure: <input type="checkbox"/> Plenum <input type="checkbox"/> Cabinet <input type="checkbox"/> Transition <input type="checkbox"/> Other: _____	-	-
3.3 Measured <b>return</b> external static pressure (Enter value only, without negative sign): _____ IWC	-	-
3.4 Measured <b>supply</b> external static pressure (Enter value only, without positive sign): _____ IWC	-	-
3.5 Measured <b>total</b> external static pressure = Value-only from Item 3.3 + Value-only from Item 3.4 = _____ IWC	-	-
3.6 <b>Measured</b> (Item 3.5) - <b>Design</b> (Item 5.4 on National HVAC Design Report) total external static pressure = _____ IWC	-	-
3.7 Measured HVAC fan airflow, using Item 3.5 and fan speed setting: _____ CFM	-	-
3.8 Measured HVAC fan airflow (Item 3.7) is $\pm 15\%$ of design HVAC fan airflow (Item 5.2 on National HVAC Design Report).	<input type="checkbox"/>	-

### 4. Air Balancing of Supply Registers & Return Grilles (Recommended, but not Required) <sup>5</sup>

4.1 Balancing report attached with room-by-room design airflows from Item 5.5 on National HVAC Design Report, and contractor-measured airflow using ANSI / ACCA 5 QI-2015 protocol.	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Room-by-room airflows verified by contractor to be within the greater of $\pm 20\%$ or 25 CFM of design airflow.	<input type="checkbox"/>	<input type="checkbox"/>



# ENERGY STAR Single-Family New Homes

## National HVAC Commissioning Checklist, Version 3 / 3.1 / 3.2 (Rev. 13)<sup>1, 2</sup>

### Footnotes

1. This Checklist is designed to align with the requirements of ANSI / ACCA's 5 QI-2015 protocol, thereby improving the performance of HVAC equipment in new homes when compared to homes 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 occupant behavior). Therefore, this Checklist is not a guarantee of proper ventilation, indoor air quality, or HVAC performance.  
  
This Checklist applies 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 other permutations of equipment (e.g., boilers, mini-split / multi-split systems) and distribution systems are exempt.
2. For a home certified in the State of ID, MT, OR, or WA, the following alternatives and exemptions apply:
  - a. For a home with an air-source heat pump up to 65 kBtuh with a forced-air distribution system (i.e., ducts), the contractor is permitted to complete the 2011 PTCS<sup>®</sup> Commissioned Heat Pump Certificate and Startup Form in lieu of this Checklist.
  - b. For a home with a split air conditioner or unitary air conditioner up to 65 kBtuh with a forced-air distribution system (i.e., ducts), the contractor is permitted to complete the Northwest Central AC Commissioning & Startup Form in lieu of this Checklist.
  - c. For a home in a location with < 600 CDD, the completion of this Checklist is recommended, but not required.
3. 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 or Approved Inspector, as defined by ANSI / RESNET / ICC 301, or an equivalent designation as determined by a Home Certification Organization (HCO); and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/newhomestraining](http://www.energystar.gov/newhomestraining).
4. Either factory-installed or field-installed TXV's may be used. For field-installed TXV's, ensure that sensing bulbs are insulated and tightly clamped to the vapor line with good linear thermal contact at the recommended orientation, usually 4 or 8 o'clock.
5. Air balancing of supply registers and return grilles is highly recommended to improve the performance of the HVAC system and comfort of the occupants, but is not required at this time for certification. When air balancing is completed, balancing dampers or proper duct sizing shall be used instead of looped or coiled ductwork to limit flow to diffusers. When balancing dampers are used, they shall be located at the trunk to limit noise unless the trunk will not be accessible when the balancing process is conducted. In such cases, Opposable Blade Dampers (OBD) or dampers located in the duct boot are permitted to be used.

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# ENERGY STAR Single-Family New Homes

## National Water Mgmt. System Builder Reqs.<sup>1</sup>, Version 3 / 3.1 / 3.2 (Rev. 13)

### Builder Responsibilities:

- It is the exclusive responsibility of builders to ensure that each certified home is constructed to meet these requirements.
- While builders are not required to maintain documentation demonstrating compliance for each individual certified home, builders are required to develop a process to ensure compliance for each certified home (e.g., incorporate these requirements into the Scope of Work for relevant sub-contractors, require the site supervisor to inspect each home for these requirements, and / or sub-contract the verification of these requirements to a Rater<sup>2</sup>).
- In the event that the EPA determines that a certified home was constructed without meeting these requirements, the home may be decertified.

### 1. Water-Managed Site and Foundation

- 1.1 Impermeable surfaces (e.g., patio, porch, or plaza slabs; sidewalks; ramps; driveways) sloped  $\geq 0.25$  in. per ft. away from home to edge of surface or 10 ft., whichever is less.<sup>3</sup>
- 1.2 Back-fill has been tamped, and permeable surfaces sloped  $\geq 0.5$  in. per ft. away from home for  $\geq 10$  ft. Alternatives in Footnote.<sup>3</sup>
- 1.3 Capillary break beneath all slabs (e.g., slab on grade, basement slab) except crawlspace slabs using either:  $\geq 6$  mil polyethylene sheeting, lapped 6-12 in., or  $\geq 1$  in. extruded polystyrene insulation with taped joints.<sup>4, 5, 6</sup>
- 1.4 Capillary break at all crawlspace floors using one of the following options:<sup>4, 5, 6</sup>
  - 1.4.1 Concrete slab over one of the following materials:
    - 1.4.1a  $\geq 6$  mil polyethylene sheeting, lapped 6-12 in; OR,
    - 1.4.1b  $\geq 1$  in. extruded polystyrene insulation with taped joints.
  - 1.4.2  $\geq 6$  mil polyethylene sheeting, lapped 6-12 in., & installed using one of the following:
    - 1.4.2a Lapped up each wall or pier and fastened with furring strips or equivalent; OR,
    - 1.4.2b Secured in the ground at the perimeter using stakes.
- 1.5 Exterior surface of below-grade walls of basements & unvented crawlspaces finished as follows:
  - a) For poured concrete, masonry, & insulated concrete forms, finish with damp-proofing coating.<sup>7</sup>
  - b) For wood framed walls, finish with polyethylene and adhesive or other equivalent waterproofing.
- 1.6 Class 1 vapor retarder not installed on interior side of vapor permeable insulation in exterior below-grade walls.<sup>8</sup>
- 1.7 Sump pit cover mechanically attached with full gasket seal or equivalent.
- 1.8 Drain tile installed at basement and crawlspace walls, with the top of the drain tile pipe below the bottom of the concrete slab or crawlspace floor. Drain tile surrounded with  $\geq 6$  in. of  $\frac{1}{2}$  to  $\frac{3}{4}$  in. washed or clean gravel and with gravel layer fully wrapped with fabric cloth. Drain tile level or sloped to discharge to outside grade (daylight) or to a sump pit with a pump. If drain tile is on interior side of footing, then channel provided through footing to exterior side.<sup>9</sup>

### 2. Water-Managed Wall Assembly

- 2.1 Flashing at bottom of exterior walls, with weep holes included for anchored stone / masonry veneer and weep screed for adhered stone / masonry veneer or stucco cladding, or equivalent drainage system.<sup>10</sup>
- 2.2 Fully sealed continuous drainage plane behind exterior cladding that laps over flashing in Item 2.1 and fully sealed at all penetrations. Additional bond-break drainage plane layer provided behind all adhered stone / masonry veneer or stucco cladding.<sup>10, 11</sup>
- 2.3 Window and door openings fully flashed.<sup>12</sup>

### 3. Water-Managed Roof Assembly

- 3.1 Step and kick-out flashing at all roof-wall intersections, extending  $\geq 4$ " on wall surface above roof deck and integrated shingle-style with drainage plane above; boot / collar flashing at all roof penetrations.<sup>13</sup>
- 3.2 For homes that don't have a slab-on-grade foundation and do have expansive or collapsible soils, gutters & downspouts provided that empty to lateral piping that discharges water on sloping final grade  $\geq 5$  ft. from foundation, or to underground catchment system not connected to the foundation drain system that discharges water  $\geq 10$  ft. from foundation. Alternatives & exemptions in Footnote.<sup>4, 14, 15</sup>
- 3.3 Self-adhering polymer-modified bituminous membrane at all valleys & roof deck penetrations.<sup>4, 16</sup>
- 3.4 In 2009 IECC Climate Zones 5 & higher, self-adhering polymer-modified bituminous membrane over sheathing at eaves from the edge of the roof line to  $> 2$  ft. up roof deck from the interior plane of the exterior wall.<sup>4, 16</sup>

### 4. Water-Managed Building Materials

- 4.1 Wall-to-wall carpet *not* installed within 2.5 ft. of toilets, tubs, and showers.
- 4.2 If present, backers for wall tile and wall panels in tub and shower enclosures are fiber-cement board complying with ASTM C1288 or ISO 8336, Category C, or an alternate material listed in the Footnote. Paper-faced backerboard shall not be used.<sup>17</sup>
- 4.3 In Warm-Humid climates, Class 1 vapor retarders not installed on the interior side of vapor permeable insulation in above-grade walls, except at shower and tub walls.<sup>8</sup>
- 4.4 Building materials with visible signs of water damage or mold *not* installed or allowed to remain.<sup>18</sup>
- 4.5 Framing members & insulation products having high moisture content *not* enclosed (e.g., with drywall).<sup>19</sup>
- 4.6 For each condensate-producing HVAC component, corrosion-resistant drain pan (e.g., galvanized steel, plastic) included that drains to a conspicuous point of disposal in case of blockage. Backflow prevention valve included if connected to a shared drainage system.

### Footnotes:

1. These requirements are designed to improve moisture control in homes. However, these features alone cannot prevent all moisture problems. For example, leaky pipes or overflowing baths can lead to moisture issues and negatively impact the performance of the home.
2. 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 or Approved Inspector, as defined by ANSI / RESNET / ICC 301, or an equivalent designation as determined by a Home Certification Organization (HCO); and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/newhomestraining](http://www.energystar.gov/newhomestraining).



# ENERGY STAR Single-Family New Homes

## National Water Mgmt. System Builder Reqs.<sup>1</sup>, Version 3 / 3.1 / 3.2 (Rev. 13)

3. Swales or drains designed to carry water from foundation are permitted to be provided as an alternative to the slope requirements for any home, and shall be provided for a home where setbacks limit space to less than 10 ft. Also, tamping of back-fill is not required if either: proper drainage can be achieved using non-settling compact soils, as determined by a certified hydrologist, soil scientist, or engineer; OR, the builder has scheduled a site visit to provide in-fill and final grading after settling has occurred (e.g., after the first rainy season).
4. Not required in Dry (B) climates as shown in 2009 IECC Figure 301.1 and Table 301.1.
5. Not required for raised pier foundations with no walls. To earn the ENERGY STAR, EPA recommends, but does not require, that radon-resistant features be included in homes built in EPA Radon Zones 1, 2 & 3. For more information, see [www.epa.gov/indoorairplus](http://www.epa.gov/indoorairplus).
6. For an existing slab (e.g., in a home undergoing a gut rehabilitation), in lieu of a capillary break beneath the slab, a continuous and sealed Class I or Class II Vapor Retarder (per Footnote 8) is permitted to be installed on top of the entire slab. In such cases, up to 10% of the slab surface is permitted to be exempted from this requirement (e.g., for sill plates). In addition, for existing slabs in occupiable space, the Vapor Retarder shall be, or shall be protected by, a durable floor surface. If Class I Vapor Retarders are installed, they shall not be installed on the interior side of vapor permeable insulation or materials prone to moisture damage.
7. Interior surface of an existing below-grade wall (e.g., in a home undergoing a gut rehab.) listed in Item 1.5a is permitted to be finished by:
  - Installing a continuous and sealed drainage plane, capillary break, Class I Vapor Retarder (per Footnote 8) and air barrier that terminates into a foundation drainage system as specified in Item 1.8; OR
  - If a drain tile is not required as specified in Footnote 9, adhering a capillary break and Class I Vapor Retarder (per Footnote 8) directly to the wall with the edges taped/sealed to make it continuous.

Note that no alternative compliance option is provided for existing below-grade wood-framed walls in Item 1.5b.

8. The 2009 IRC defines Class I vapor retarders as a material or assembly with a rating of  $\leq 0.1$  perm, using the desiccant method with Proc. A of ASTM E 96. The following materials are typically  $\leq 0.1$  perm and shall not be used on the interior side of vapor permeable insulation in above-grade exterior walls in warm-humid climates or below-grade exterior walls in any climate: rubber membranes, polyethylene film, glass, aluminum foil, sheet metal, and foil-faced insulating / non-insulating sheathings. These materials can be used on the interior side of walls if vapor permeable insulation is not present (e.g., foil-faced rigid foam board adjacent to a below-grade concrete foundation wall is permitted).

Note that this list is not comprehensive and other materials with a perm rating  $\leq 0.1$  also shall not be used. Also, if mfr. spec.'s for a product indicate a perm rating  $\geq 0.1$ , then it may be used, even if it is in this list. Also note that open-cell and closed-cell foam generally have ratings above this limit and may be used unless mfr. spec.'s indicate a perm rating  $\leq 0.1$ . Several exemptions to these requirements apply:

- Class I vapor retarders, such as ceramic tile, may be used at shower and tub walls;
  - Class I vapor retarders, such as mirrors, may be used if mounted with clips or other spacers that allow air to circulate behind them.
9. Alternatively, either a drain tile that is pre-wrapped with a fabric filter or a Composite Foundation Drainage System (CFDS) that has been evaluated by ICC-ES per AC 243 are permitted to be used. Note that the CFDS must include a soil strip drain or another ICC-ES evaluated perimeter drainage system to be eligible for use. In an existing home (e.g., in a home undergoing a gut rehab.) a drain tile installed only on the interior side of the footing without a channel is permitted. Additionally, a drain tile is not required when a certified hydrologist, soil scientist, or engineer has determined that a crawlspace foundation, or an existing basement foundation (e.g., in a home undergoing a gut rehab.), is installed in Group I Soils (i.e., well-drained ground or sand-gravel mixtures), as defined by 2009 IRC Table R405.1.
  10. These Items not required for existing structural masonry walls (e.g., in a home undergoing a gut rehabilitation). Note this exemption does not extend to existing wall assemblies with adhered or anchored stone / masonry veneers.
  11. Any of the following systems may be used: a monolithic weather-resistant barrier (i.e., house wrap) shingled at horizontal joints and sealed or taped at all joints; weather resistant sheathings (e.g., faced rigid insulation) fully taped at all "butt" joints; lapped shingle-style building paper or felts; or other water-resistive barrier recognized by ICC-ES or other accredited agency.
  12. Apply pan flashing over the rough sill framing, inclusive of the corners of the sill framing; side flashing that extends over pan flashing; and top flashing that extends over side flashing or equivalent details for structural masonry walls or structural concrete walls.
  13. Intersecting wall siding shall terminate 1 in. above the roof or higher, per manufacturer's recommendations. Continuous flashing shall be installed in place of step flashing for metal and rubber membrane roofs.
  14. The assessment of whether the soil is expansive or collapsible shall be completed by a certified hydrologist, soil scientist, or engineer.
  15. Any of the following are permitted to be used as alternatives to Item 3.2: a) a roof design that deposits rainwater to a grade-level rock bed with a waterproof liner and a lateral drain pipe that meets discharge requirements per Item 3.2; b) a rainwater harvesting system that drains overflow to meet discharge requirements per Item 3.2; or c) a continuous rubber membrane (e.g. EPDM) that is aligned with the foundation wall from final grade to  $\geq 8$  in. below grade and then slopes  $\geq 0.5$  in. per ft. away from the home for at least 5 ft., with Group I Soils (as defined in Footnote 9) covering the membrane to within 3 in. of final grade.
  16. As an alternative, any applicable option in 2009 IRC Section R905.2.8.2 is permitted to be used to meet Item 3.3 and any option in 2009 IRC Section R905.2.7.1 is permitted to be used to meet Item 3.4. EPA recommends, but does not require, that products meet ASTM D1970. In addition, any option in 2009 IRC Section R905.13 is permitted to be used to meet either Item 3.3 or 3.4.
  17. In addition to fiber-cement board, fiber-mat reinforced cementitious panels complying with ASTM C1325; glass mat water-resistant gypsum panels complying with ASTM C1178; water-resistant fiber-reinforced gypsum panels complying with Section 6 of ASTM C1278; or materials that have been evaluated by ICC-ES per AC 115 may also be used to meet this requirement. Paper-faced backerboard may only be used behind monolithic enclosures or waterproof membranes that have been evaluated by ICC-ES per AC 115, and then only if it has received a rating of 10 when tested in accordance with ASTM D3273.
  18. If mold is present, effort should be made to remove all visible signs of mold (e.g., by damp wipe with water and detergent). If removal methods are not effective, then the material shall be replaced. However, stains that remain after damp wipe are acceptable. Lumber with "sap stain fungi" is exempt from this Item as long as the lumber is structurally intact.
  19. For wet-applied insulation, follow manufacturer's drying recommendations. EPA recommends that lumber moisture content be  $\leq 18\%$ .

## SECTION 033000 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 SECTION REQUIREMENTS

- A. Submittals: In addition to Product Data, submit design mixes for each concrete mix.
- B. Ready-Mixed Concrete Producer Qualifications: ASTM C 94/C 94M.
- C. Refer to Specifications section 018113 for Sustainable Design Requirements.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ACI 301, "Specification for Structural Concrete," and with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- B. Quality Assurance: Comply with ACI 301, "Specification for Structural Concrete," and ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
  - 1. Installer Qualifications: An experienced installer who has completed pavement work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
  - 2. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

#### 2.2 MATERIALS

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Plain Steel Wire: ASTM A 82/A 82M, as drawn.
- C. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, as drawn, flat sheet.
- D. Portland Cement: ASTM C 150, Type I or II.
- E. Fly Ash: ASTM C 618, Class C or F.
- F. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- G. Silica Fume: ASTM C 1240, amorphous silica.
- H. Aggregates: ASTM C 33, Uniformly graded from a single source.
  - 1. Maximum Coarse-Aggregate Size: **1 inch (25 mm)** nominal.



- I. Air-Entraining Admixture: ASTM C 260.
- J. Chemical Admixtures: ASTM C 494, water reducing, high-range water reducing, water reducing and accelerating, and water reducing and retarding. Do not use calcium chloride or admixtures containing calcium chloride.
- K. Synthetic Fiber: ASTM C 1116/C 1116M, Type III, polypropylene fibers, 1/2 to 1-1/2 inches (13 to 38 mm) long.
- L. Vapor Retarder: Reinforced sheet, ASTM E 1745, Class A.
- M. Penetrating Liquid Floor Treatments for Polished Concrete Finish: Clear, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and is suitable for polished concrete surfaces.
- N. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- O. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- P. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
- Q. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
- R. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

## 2.3 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301.
- B. Normal-Weight Concrete:
  - 1. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.
  - 2. Maximum Water-Cementitious Materials Ratio: [0.50] [0.45] [0.40] <Insert ratio>.
  - 3. Slump Limit: 4 inches (100 mm)
  - 4. Air Content: Maintain within range permitted by ACI 301. Do not allow air content of floor slabs to receive troweled finishes to exceed 3 percent.
  - 5. Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 30 percent for concrete with at least 50% recycled aggregate.
- C. Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116.
  - 1. When air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 CONCRETING

- A. Construct formwork according to ACI 301 and maintain tolerances and surface irregularities within ACI 347R limits of Class A, 1/8 inch (3.2 mm) for concrete exposed to view and Class B, 1/4 inch (6 mm) for other concrete surfaces.
- B. Place vapor retarder on prepared subgrade, with joints lapped 6 inches (150 mm) and sealed.
- C. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- D. Install construction, isolation, and contraction joints where indicated. Install full-depth joint-filler strips at isolation joints.
- E. Place concrete in a continuous operation and consolidate using mechanical vibrating equipment.
- F. Protect concrete from physical damage, premature drying, and reduced strength due to hot or cold weather during mixing, placing, and curing.
- G. Formed Surface Finish: Smooth-formed finish for concrete exposed to view, coated, or covered by waterproofing or other direct-applied material; rough-formed finish elsewhere.
- H. Slab Finishes: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces. Provide the following finishes:
  - 1. Scratch finish for surfaces to receive mortar setting beds.
  - 2. Float finish for surfaces to receive waterproofing, roofing, or other direct-applied material.
  - 3. Troweled finish for floor surfaces and floors to receive floor coverings, paint, or other thin film-finish coatings.
  - 4. Trowel and fine-broom finish for surfaces to receive thin-set tile.
  - 5. Nonslip-broom finish to exterior concrete platforms, steps, and ramps.
- I. Cure formed surfaces by moisture curing for at least seven days.
- J. Begin curing concrete slabs after finishing. Apply membrane-forming curing compound to concrete.
- K. Contractor shall engage a testing agency to perform field tests and to submit test reports.
- L. Protect concrete from damage. Repair and patch defective areas.

END OF SECTION 033000



SECTION 033053 - CAST-IN-PLACE CONCRETE (LIMITED APPLICATIONS)

1.1 GENERAL

- A. Summary: The work of this Section pertains to site concrete work.
- B. Submittals: In addition to Product Data, submit design mixes for each concrete mix.
- C. Quality Assurance: Comply with ACI 301, "Specification for Structural Concrete," and ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
  - 1. Installer Qualifications: An experienced installer who has completed pavement work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
  - 2. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1.2 PRODUCTS

- A. Concrete Materials: As follows:
  - 1. Portland Cement: ASTM C 150, Type I or II. Fly Ash ASTM C 618, Class C or F.
  - 2. Aggregate: ASTM C 33, uniformly graded, from a single source.
  - 3. Water: ASTM C 94.
  - 4. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, 1/2 to 1 inch long.
  - 5. Air-Entraining Admixture: ASTM C 260.
- B. Related Materials: As follows:
  - 1. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.
  - 2. Steel: Dowels and rebar of ASTM A 615/A 615M, Grade 60, deformed.
  - 3. Form work: Furnish formwork and formwork accessories according to ACI 301.
- C. Curing Materials: Any of the following:
  - 1. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
  - 2. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
  - 3. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- D. Concrete Mixes: Prepare design mixes, proportioned according to ACI 301, with the following properties:
  - 1. Compressive Strength (28 Days): 4000 psi min.
  - 2. Slump: 4 inches.
  - 3. Air Content: 3.0 percent for interior applications and 3.0 to 5.0 percent for exterior applications.
- E. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. Yd.
- F. Ready-Mixed Concrete: Comply with ASTM C 94/C 94M.
- G. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

### 1.3 EXECUTION

- A. Excavate sub-base as needed to provide crushed gravel base (amount as indicated on drawings) and concrete slabs for walkway surfaces and vehicle surfaces in thicknesses noted on drawings. Compact sub-base and gravel base with vibrating compactor.
- B. Vapor Barrier - Place vapor barrier under gravel base where indicated on drawings. Protect vapor barrier from damage.
- C. Joints: Locate and install construction, isolation, and contraction joints to match existing patterns/ spacing. Install control joints a min. of every 100 square feet of concrete or every 10' of walkway.
  - 1. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
- D. Concrete Placement: Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete. Form concrete per drawings, in straight true and plumb forms. Design, construct, erect, brace, and maintain formwork according to ACI 301.
  - 1. Place steel reinforcement in accordance with CXRSI's "Manual of Standard Practice."
  - 2. Consolidate concrete with mechanical vibrating equipment.
  - 3. Screed and initial-float concrete surfaces using bull floats or darbies before excess moisture or bleedwater appears on the surface.
- E. Finish formed surfaces as follows:
  - 1. Rough-Formed Finish: Apply to concrete surfaces not exposed to public view.
  - 2. Smooth-Formed Finish: Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
- F. Finish unformed surfaces as follows:
  - 1. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to flat walkway and driveway paving surfaces. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.
  - 2. Nonslip Broom Finish: Apply a nonslip broom finish to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
- G. Concrete Protection and Curing: Protect concrete from cold or hot weather during mixing, placing, and curing.
  - 1. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
  - 2. Cure formed and unformed concrete for at least seven days by moisture curing, moisture-retaining-cover curing, or curing compound.
- H. Protect concrete from damage. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION 033053

## SECTION 042000 - UNIT MASONRY

### PART 1 - GENERAL

#### 1.1 SECTION REQUIREMENTS

- A. See Section 055000 "Metal Fabrications" for furnishing steel lintels and shelf angles for unit masonry.
- B. Submittals:
  - 1. Samples for face brick, precast concrete sill, and colored mortar
  - 2. Product data for face brick, precast concrete sill, mortar, reinforcing steel, horizontal reinforcing, brick ties, and flashing.
  - 3. Material Certificates: For each type of product indicated. Include statements of material properties indicating compliance with requirements.

### PART 2 - PRODUCTS

#### 2.1 UNIT MASONRY

- A. Comply with TMS 602/ACI 530.1/ASCE 6.

#### 2.2 MASONRY UNITS

- A. Concrete Masonry Units: ASTM C 90; Density Classification, Structural Weight.
  - 1. Integral water repellent.
  - 2. Special shapes for bond beams, lintels, corners, jambs, sash, control joints, and other special conditions.
  - 3. Square-edged units for outside corners unless otherwise indicated.
- B. Concrete Lintels: ASTM C 1623, precast units matching concrete masonry units and with reinforcing bars indicated or required to support loads indicated.

#### 2.3 CLAY FACING BRICK

- A. Face Brick: ASTM C 216; Grade SW
- B. Size: Modular – 3 5/8" x 2 1/4" x 7 5/8".
- C. Solid brick with exposed surfaces finished for ends
- D. Special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

## 2.4 MODULAR CAST STONE

- A. Custom Cast Stone Units: RockCast's Custom Cast Stone Series, or equal
- B. ASTM C 1364
- C. Shape: Custom brick cap/window sill shape.
- D. Texture: Smooth

## 2.5 MORTAR AND GROUT

- A. Mortar: ASTM C 270, proportion specification.
  - 1. Use Portland cement mortar.
  - 2. Do not use calcium chloride in mortar.
  - 3. For masonry below grade or in contact with earth, use Type M.
  - 4. For reinforced masonry, use Type S.
  - 5. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions, and for other applications where another type is not indicated, use Type N.
  - 6. Water-Repellent Additive: For mortar used with concrete masonry units made with integral water repellent, use product recommended by manufacturer of units.
- B. Grout: ASTM C 476 with a slump of 8 to 11 inches (200 to 280 mm).
- C. Refractory Mortar: Ground fireclay mortar or other refractory mortar that passes ASTM C 199 test and is acceptable to authorities having jurisdiction.

## 2.6 REINFORCEMENT, TIES, AND ANCHORS

- A. Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).
- B. Joint Reinforcement: ASTM A 951/A 951M.
  - 1. Coating: Hot-dip galvanized at both interior and exterior walls.
  - 2. Wire Size for Side Rods: 0.148-inch (3.77-mm) diameter.
  - 3. Wire Size for Cross Rods: 0.148-inch (3.77-mm) diameter.
  - 4. Wire Size for Veneer Ties: 0.148-inch (3.77-mm) diameter.
  - 5. For single-wythe masonry, provide either ladder design or truss design.
  - 6. For multiwythe masonry, provide ladder design with adjustable side rods.
- C. Veneer Anchors: Hot-dip galvanized steel, two-piece adjustable masonry veneer anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to studs, and acceptable to authorities having jurisdiction.

## 2.7 EMBEDDED FLASHING MATERIALS

- A. Sheet Metal Flashing: Stainless steel, 0.0156 inch (0.4 mm) thick.

- B. Butyl Rubber Flashing: Pliable, butyl rubber compound, bonded to a polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.040 inch (1.0 mm). Use only where flashing is fully concealed.

## 2.8 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded strips complying with ASTM D 1056, Grade 2A1.
- B. Preformed Control-Joint Gaskets: Designed to fit standard sash block and to maintain lateral stability in masonry wall; made from styrene-butadiene rubber or PVC.
- C. Weep Holes: Round polyethylene tubing, 3/8-inch (9.5-mm) OD with wicking material, 48" O.C.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Cut masonry units with saw. Install with cut surfaces and, where possible, cut edges concealed.
- B. Mix units for exposed unit masonry from several pallets or cubes as they are placed to produce uniform blend of colors and textures.
- C. Stopping and Resuming Work: Step back units; do not tooth.
- D. Fill cores in hollow concrete masonry units with grout as detailed.
- E. Tool exposed joints slightly concave when thumbprint hard unless otherwise indicated.
- F. Keep cavities clean of mortar droppings and other materials during construction.

### 3.2 LINTELS AND BOND BEAMS

- A. Install lintels and bond beams where indicated.

### 3.3 FLASHING AND WEEP HOLES

- A. Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated.
- B. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing before covering with mortar.
  - 1. Extend flashing 4 inches (100 mm) into masonry at each end and turn up 2 inches (50 mm) to form a pan.
- C. Trim wicking material used in weep holes flush with outside face of wall after mortar has set.

3.4 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Contractor shall engage special inspectors to perform tests and inspections required by authorities having jurisdiction.
  - 1. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.

3.5 CLEANING

- A. Clean masonry as work progresses. Remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly cured, clean exposed masonry.
  - 1. Wet wall surfaces with water before applying acidic cleaner, then remove cleaner promptly by rinsing thoroughly with clear water.
  - 2. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

END OF SECTION 042000

## SECTION 061000 - ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Wood framing.
  - 2. Wood supports.
  - 3. Wood blocking.
  - 4. Wood nailers.
  - 5. Wood furring.
  - 6. Wood grounds.
  - 7. Wood sheathing.
  - 8. Plywood backing panels
  - 9. Exterior Wall Sheathing

#### 1.2 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product indicated.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that materials comply with requirements.
- B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses.
- C. Research/Evaluation Reports: For the following:
  - 1. Treated wood.
  - 2. Engineered wood products.
  - 3. Foam-plastic sheathing.
  - 4. Power-driven fasteners.
  - 5. Powder-actuated fasteners.
  - 6. Expansion anchors.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  - 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 manufacturers specified.

## 2.2 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber indicated to receive stained or natural finish, mark grade stamp on end or back of each piece.
  - 3. Provide dressed lumber, S4S, unless otherwise indicated.
  - 4. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.
- B. Wood Structural Panels:
  - 1. Plywood: DOC PS 1.
  - 2. Comply with "APA Design/Construction Guide: Residential & Commercial."

## 2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWWA U1 interior construction not in contact with ground. UC3b for exterior construction not in contact with ground. Use UC4a for items in contact with ground. AWWA C9 (plywood), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWWA C31 with inorganic boron (SBX).
- B. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
- C. Mark each treated item with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
  - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
  - 3. Wood floor plates that are installed over concrete slabs directly in contact with earth.

## 2.4 DIMENSION LUMBER

- A. General: Of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
- B. Non-Load-Bearing Interior Partitions: No. 1 grade and any of the following species:
  - 1. Mixed southern pine; SPIB.
  - 2. Approved equal. Written approval by Architect required prior to use.
- C. Framing Other Than Non-Load-Bearing Partitions: No. 1 grade and any of the following species:
  - 1. Southern pine; SPIB.
  - 2. Approved equal. Written approval by Architect required prior to use.



2.5 SHEATHING

- A. Plywood Wall Sheathing: Exterior Grade APA sheathing.
- B. Plywood Roof Sheathing: Exterior Grade APA sheathing.

2.6 INSULATED WALL SHEATHING

- A. Engineered, air and moisture resistant wall sheathing.
  - 1. Warranty – 30-years from date of substantial completion.
  - 2. Basis-of-Design Product – Zip-System-Sheathing as manufactured by Huber Engineered Woods, LLC, Charlotte NC.
  - 3. Performance Requirements:
    - a. Air-barrier Assembly Leakage: Less than 0.04 cfm/sq.ft. at 1.57 lbf/sq.ft. per ASTM E2375
    - b. Water-vapor Permeance, Facer: Min. 12 perms ASTM E96/E96M.
  - 4. Oriented Strand Board: DOC PS 2.
  - 5. Structural Wall Sheathing:
    - a. Thickness: ½"
    - b. Square edge profile
    - c. Exterior Facer: Medium-density, phenolic-impregnated polymer-modified sheet material meeting ASTM D779 Grade D weather-resistive barrier in accordance with ICC AC38 and AC310, with fastener spacing symbols on exterior face for 16-inch O.C.
      - 1) Water Resistance of Coatings, ASTM D2247; Pass 14-day test.
      - 2) Moisture Vapor Transmission, ASTM E96, not less than 12 perms.
      - 3) Water Penetration, ASTM E331: Pass at 2.86 lbf/sq.ft.
    - d. Fasteners – hot dip zinc coating, ASTM A153/A 153M.
  - 6. Flashing Tape: Pressure-sensitive, self-adhering, cold-applied, seam tape consisting of polyolefin film with acrylic adhesive, meeting ICC AC148.
    - a. Thickness: 0.012-inch min.

2.7 MISCELLANEOUS MATERIALS

- A. Fasteners:
  - 1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153, or of Type 304 stainless steel.
  - 2. Power-Driven Fasteners: CABO NER-272.
  - 3. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
  - 4. Fasteners in contact with treated wood: Provide Hot-Dip Galvanized steel fasteners that meet ASTM-A153 (for hot-dip fastener products) and ASTM A-653 (Coating designation G-185 for hot-dip connector and sheet products). Provide approved spacers for all aluminum products that come in contact with treated wood.
- B. Metal Framing Anchors: Made from hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation. Provide approved coating where anchors come in contact with treated wood.
  - 1. Manufacturers:
    - a. Simpson Strong-Tie Company, Inc.

- b. Approved equal. Written approval by Architect required prior to use.
- 2. Research/Evaluation Reports: Provide products acceptable to authorities having jurisdiction and for which model code research/evaluation reports exist that show compliance of metal framing anchors, for application indicated, with building code in effect for Project.
- 3. Allowable Design Loads: Meet or exceed those indicated per manufacturer's published values determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- C. Building Paper: Asphalt-saturated organic felt complying with ASTM D 226, Type II (No. 30 asphalt felt), unperforated.
- D. Building Wrap: Air-retarder sheeting made from polyolefins; cross-laminated films, woven strands, or spun-bonded fibers; coated or uncoated; with or without perforations; and complying with ASTM E 1677, Type I.
  - 1. Thickness: Not less than 3 mils (0.08 mm).
  - 2. Permeance: Not less than 10 perms (575 ng/Pa x s x sq. m).
  - 3. Flame-Spread Index: 25 or less per ASTM E 84.
  - 4. Allowable Exposure Time: Not less than three months.
  - 5. Building Wrap Tape: Pressure-sensitive plastic tape recommended by building wrap manufacturer for sealing joints and penetrations in building wrap.
- E. Adhesives for Field Gluing Panels to Framing: Formulation complying with ASTM D 3498 that is approved for use with type of construction panel indicated by both adhesive and panel manufacturers.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Apply field treatment complying with AWPAC M4 to cut surfaces of preservative-treated lumber and plywood.
- C. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. CABO NER-272 for power-driven fasteners.
  - 2. Published requirements of metal framing anchor manufacturer.
  - 3. Table 2305.2, "Fastening Schedule," in the BOCA National Building Code.
- D. Use finishing nails for exposed work, unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
- E. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.
- F. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- G. Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.
  - 1. Comply with "Code Plus" provisions in above-referenced guide.

H. Fastening Methods:

1. Roof Sheathing: Nail to wood framing.
2. Wall Sheathing: Install per manufacturer published instructions.

END OF SECTION 061000

## SECTION 062023 – INTERIOR FINISH CARPENTRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Standing and running trim.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of factory-fabricated product and process indicated.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS, GENERAL

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," for lumber and with applicable grading rules of inspection agencies certified by the American Lumber Standards Committee Board of Review.

#### 2.2 INTERIOR STANDING AND RUNNING TRIM

- A. Interior Standing and Running Trim: primed; paint-ready lumber and moldings.
  - 1. Species and Grade or Cut: C Select, eastern white pine; NELMA or B & Btr. Select or Supreme, Idaho white, lodgepole, ponderosa, or sugar pine; WWPA.
- B. Wood Molding Patterns: Stock moldings made to patterns included in WMMPA WM 7 and graded under WMMPA WM 4.
  - 1. Base: 623 – 9/16" x 3 1/4"
  - 2. Casing: 356 – 11/16" x 2 1/4"
  - 3. Shoe Mold: 126 – 1/2" x 3/4"
- C. MISCELLANEOUS MATERIALS
- D. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue.
  - 1. Use wood glue that has a VOC content of 30 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- E. Fasteners for Exterior Finish Carpentry: Provide nails of stainless steel, or noncorroding aluminum.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Condition finish carpentry to average prevailing humidity conditions in installation areas before installation, for a minimum of 24 hours.

#### 3.2 INSTALLATION

- A. Install finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where required for alignment. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts.
- B. Standing and Running Trim: Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Stagger joints in adjacent and related trim. Cope at returns and miter at corners.
- C. Repair damaged or defective finish carpentry where possible to eliminate functional or visual defects. Where not possible to repair, replace finish carpentry. Adjust joinery for uniform appearance.
- D. Install cellular trim per manufacturer's printed instructions. Provide fasteners, hangers and adhesives as recommended by manufacturer.

END OF SECTION 062023

## SECTION 072100 - BUILDING INSULATION

### PART 1 - GENERAL

#### 1.1 SUMMARY

This Section includes the following:

1. Foundation, Cavity wall, and attic insulation.
2. Reference specification Section 018113 for LEED Requirements.
  - a. Insulation material shall contain a recycled content of 25% post-consumer or 50% pre-consumer.

The Contractor shall provide and install insulation in the following locations:

1. Foundation walls
2. Exterior cavity walls
3. Attics

#### 1.2 SUBMITTALS

Product Data: For each product indicated.

Product test reports.

Research/evaluation reports.

#### 1.3 QUALITY ASSURANCE

Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84 for surface-burning characteristics and other methods indicated with product, by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

### PART 2 - PRODUCTS

#### 2.1 INSULATING MATERIALS

General: Provide insulating materials that comply with requirements and with referenced standards and, for preformed units, in sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths, and lengths.

Glass-Fiber Loose-Fill Insulation: ASTM C 764 for type (method of application) indicated below; maximum flame-spread and smoke-developed indices of 5, and as follows:

1. Type 1 for pneumatic application.
2. Provide insulation baffles for all vented soffit areas.

Cellulose Loose-Fill Insulation: ASTM C 739-08 for type (method of application) indicated below; maximum flame-spread and smoke-developed indices of 5, and as follows:

1. Type 1 for pneumatic application.
2. Provide insulation baffles for all vented soffit areas.

Mineral-fiber blanket insulation consisting of fibers manufactured from glass:

1. Provide new insulation as indicated on the drawings.
  - a. Mineral-Fiber Blanket Insulation: Kraft-faced fiberglass batt or roll insulation. ASTM C 665, Type I; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

Glass-Fiber Blanket Insulation:

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. CertainTeed Corporation
  - b. Guardian Building Products, Inc.
  - c. Johns Manville
  - d. Knauf Insulation
  - e. Owens Corning
3. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
4. Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).

Extruded Polystyrene Insulation:

1. Extruded polystyrene (XPS): ASTM – C578, R-5/inch. with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics. Install 2" thick minimum, per manufacturer's instructions.

Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

## 2.2 VAPOR RETARDERS

Polyethylene Vapor Retarder: ASTM D 4397, Reinforced 6 mils thick, with maximum permeance rating of 0.13 perm.

Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

## 2.3 AUXILIARY INSULATING MATERIALS

Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

## EXECUTION

### 3.1 INSTALLATION

General: Provide and install insulation as indicated on the drawings and this Section. Install insulation to comply with insulation manufacturer's written instructions applicable to products and application indicated. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

Installation of General Building Insulation: Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units. Do not install kraft face against light fixtures or other devices that generate heat, thereby creating a potential fire hazard.

1. Set vapor-retarder-faced units with vapor retarder to warm side of construction, walls and roof/ceilings, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
  - a. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
2. Install blankets in cavities formed by framing members according to the following requirements:
  - a. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
  - b. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. For wood-framed construction, install mineral-fiber blankets according to ASTM C 1320 and as follows:
  - a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to produce airtight installation after concealing finish material is in place. Stuff glass-fiber, loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.
4. Place/Install glass-fiber, loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.
5. Place/install glass-fiber or cellulose, loose-fill insulation in all attic spaces to achieve R-Rating indicated on drawings. Prior to installing attic insulation, install soffit vent baffles between all roof trusses to ensure that soffit venting is not obstructed. Remove any insulation that falls behind baffles that would block soffit ventilation.

END OF SECTION 072100



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## SECTION 073113 - ASPHALT SHINGLES

### PART 1 - GENERAL

#### 1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, samples and ICC-ES evaluation reports.
- B. Warranties: Manufacturer's standard written warranty, signed by manufacturer agreeing to promptly repair or replace asphalt shingles that fail in materials for a period of 25 years, prorated, with first five years non-prorated. GAF Weather Stopper Golden Pledge Ltd. Warranty or warranty of equal provisions.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A. Identify products with appropriate markings of testing and inspecting agency acceptable to authorities having jurisdiction.

#### 2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Dimensional Three-Tab-Strip Asphalt Shingles: ASTM D 3462/D 3462M, glass-fiber reinforced, mineral-granule surfaced, and self-sealing; with tabs regularly spaced.
  - 1. GAF Timberline HDZ, 5" exposure, UL Class A, or
  - 2. Owens-Corning Duration, 5" exposure, UL Class A, or
  - 3. CertainTeed XT 25, 5" exposure, UL Class A.

#### 2.3 ACCESSORIES

- A. Felts: ASTM D 226/D 226M, Type 1 or II, asphalt-saturated organic felts.
- B. Self-Adhering Sheet Underlayment: ASTM D 1970/D 1970M, SBS-modified asphalt; mineral-granule or slip-resisting-polyethylene surfaced; with release paper backing; cold applied.
- C. Ridge Vent: Rigid UV-stabilized plastic ridge vent; for use under ridge shingles.
- D. Asphalt Roofing Cement: ASTM D 4586/D 4586M, Type II, asbestos free.
- E. Roofing Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel shingle nails, minimum 0.120-inch (3-mm) diameter, of sufficient length to penetrate 3/4 inch (19 mm) into solid wood decking or extend at least 1/8 inch (3 mm) through OSB or plywood sheathing.
  - 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- F. Felt-Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch (25-mm) minimum diameter.

- G. Sheet Metal Flashing and Trim: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
  - 1. Sheet Metal: Stainless steel (ASTM A 240/A 240M, Type 304 not less than 0.015-inches thick)
  - 2. Aluminum Valleys and Trim: (ASTM B 209 not less than 0.032-inches thick with two-coat fluoropolymer system coating – color selected by Architect from standard colors).
  - 3. Gutters: See Section 076200
  - 4. Downspouts: See Section 076200
  - 5. Drip Edge: Formed aluminum with at least a 2-inch (50-mm) roof deck flange and a 1-1/2-inch (38-mm) fascia flange with a 3/8-inch (9.6-mm) drip at lower edge.
  - 6. Open-Valley Flashing: Fabricate with aluminum 1-inch- (25-mm-) high, inverted-V profile at center of valley and equal flange widths of 10 inches.
  - 7. Soil Stack and Pipe Penetration Flashing: EPDM or silicone boot bonded to aluminum base. Top of boot shall incorporate compression band to provide seal between pipe OD and boot.
- H. Gutter Hangers: See Section 076200
- I. Butyl Sealant: ASTM C1311.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Comply with manufacturer's printed installation instructions in order to comply with warranty provisions. Also, install in accordance with recommendations in ARMA's "Residential Asphalt Roofing Manual" and with asphalt shingle recommendations in NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems" where differences exist between manufacture's printed instructions and those of ARMA and NRCA, the manufacturer's instructions shall take precedence.
- B. Apply self-adhering sheet underlayment at eaves and rakes from edges of roof to at least 36 inches inside exterior wall line.
- C. Apply self-adhering sheet underlayment at valleys extending 18 inches (450 mm) on each side.
- D. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment.
- E. Install valleys complying with NRCA instructions. Construct sheet metal open valleys. Do not "lace" shingles.
- F. Install metal flashings to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
- G. Install first and remaining courses of asphalt shingles, stair-stepping diagonally across roof deck with manufacture's recommended offset pattern at succeeding courses and maintaining uniform exposure.
- H. All shingles shall be installed with nails – staples are not acceptable.

END OF SECTION 073113

## SECTION 074633 – PLASTIC SIDING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes vinyl siding and vinyl vented soffit
- B. This Section includes shutters, aluminum trim and PVC trim.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Samples: Full-size units of each type of siding and trim and in each color, texture, and pattern required.

### PART 2 - PRODUCTS

#### 2.1 SIDING

- A. Formed-Vinyl Siding: Solid vinyl siding (minimum .040 gauge), vertical, double 4", and accessories complying with ASTM D 3679.
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
  - 2. Products: Subject to compliance with requirements, provide one of the following:
    - a. Alcoa Building Products;
    - b. Alside, Inc.;
    - c. Bird Vinyl Products;
    - d. Certain Teed Corp., Vinyl Building Products Group;
    - e. Crane Plastics;
    - f. Gentek Building Products;
    - g. Georgia-Pacific Corp.;
    - h. Heartland Building Products;
    - i. Norandex, Inc.
    - j. Owens Corning/AmeriMark Building Products, Inc.;
    - k. Reynolds Metals Co.;
    - l. Westlake Royal Building Products;
    - m. Or approved equal.
  - 3. Color and Texture: As selected from manufacturers full range. Colors shall be selected by owner during submittal process.
  - 4. Pattern: Horizontal, double 4", style. Vertical, Board and Batten style.

2.2 SOFFIT

- A. Vinyl Soffit: Perforated (vented) vinyl soffit and accessories complying with ASTM D 4477, 12-inch exposure in double 6-inch style.

1. Color and Texture: As selected by owner from manufacturer's full range.

2.3 ALUMINUM TRIM

- A. Aluminum fascia trim: Fabricate per drawings and existing conditions using 0.024-inch coil coated aluminum.

1. Color and Texture: As selected by owner from manufacturer's full range.

2. Size of trim- Refer to drawings for shape and size.

2.4 ACCESSORIES

- A. Siding Accessories: Provide starter strips, edge trim, corner trim, window head flashing, corner cap, mounting blocks, and other items as recommended by manufacturer and/or indicated in drawings for building configuration; match type of siding.

- B. Fasteners: Noncorrosive aluminum siding nails, in sufficient length to penetrate a minimum of 1 inch into substrate. Provide prefinished fasteners in color to match siding where face nailing is unavoidable.

2.5 PVC TRIM

- A. Rake, window and door trim: Fabricate per drawings with cellular PVC trim, fascia, and sheet.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Coordinate installation with flashings and other adjoining construction to ensure proper sequencing.
- B. Center nails in elongated nailing slots without binding siding to allow for thermal movement. Overlap joints to shed water away from direction of prevailing wind.
- C. Install vinyl siding, soffit, and accessories according to ASTM D 4756.
- D. Install cellular PVC as recommended and instructed by manufacturer. Provide fasteners appropriate for surface installation.

END OF SECTION 074633

## SECTION 076200 - SHEET METAL FLASHING AND TRIM

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes sheet metal flashing and trim for the following:
  - 1. Roof-drainage systems (gutters and downspouts).
  - 2. Exposed trim, and fascia.
  - 3. Copings.
  - 4. Metal flashing.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.
- C. Samples: For each exposed finish.

### PART 2 - PRODUCTS

#### 2.1 METALS

- A. Copper: ASTM B 370; temper H00, cold rolled except where temper 060 is required for forming; not less than 20 oz./sq. ft.
- B. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper indicated.
  - 1. Anodized Aluminum Sheet: ASTM B 209, alloy 5005-H14, with a minimum thickness of 0.032 inch.
- C. Stainless-Steel Sheet: ASTM A 167, Type 304, soft annealed, with No. 2D finish, except where harder temper is required for forming or performance; minimum 0.0250 inch thick.
- D. Coil-Coated Galvanized Steel Sheet: Zinc-coated, commercial-quality steel sheet complying with ASTM A 755/A 755M, G 90 coating designation, coil coated with high-performance fluoropolymer coating; not less than 0.0336 inch thick.
  - 1. High-Performance Organic Coating: Fluoropolymer two-coat system with fluoropolymer coat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.
    - a. Color and Gloss: As selected from manufacturer's full range.

## 2.2 ROOF DRAINAGE

- A. Gutters: 6-inch OG, 0.032-inch aluminum. Color as selected from manufacturer's standard selections. Furnish waterfall-type gutter guards on all new gutters.
- B. Downspouts: 4-inch x 5-inch rectangular, corrugated, 0.027-inch aluminum. Color as selected from manufacturer's standard selections.
- C. Rain Gear Accessories:
  - 1. Downspout Clip – 0.042-inch aluminum.
  - 2. Hangers – Concealed combination hanger supporting both the front and back of gutter. 0.081-inch aluminum. Secure to gutter board with screws.

## 2.3 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Solder: ASTM B 32, Grade Sn50, used with rosin flux.
- B. Solder for Stainless Steel: ASTM B 32, Grade Sn60, used with an acid flux of type recommended by stainless-steel sheet manufacturer; use a noncorrosive rosin flux over tinned surfaces.
- C. Stainless-Steel Welding Rods: Type recommended by stainless-steel sheet manufacturer for type of metal sheets furnished.
- D. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.
- E. Asphalt Mastic: SSPC-Paint 12, solvent-type, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coat.
- F. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
- G. Elastomeric Sealant: As recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements specified in Division 7 Section "Joint Sealants ."
- H. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior nonmoving joints, including riveted joints.
- I. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.
- J. Paper Slip Sheet: 5-lb/square red rosin, sized building paper, FS UU-B-790, Type I, Style 1b.
- K. Polyethylene Underlayment: ASTM D 4397, minimum 6-mil- thick black polyethylene film, resistant to decay when tested according to ASTM E 154.
- L. Metal Accessories: Sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.
- M. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

## 2.4 FABRICATION, GENERAL

- A. Sheet Metal Fabrication Standard: Fabricate units to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, material, metal thickness, and other characteristics of item indicated.
- B. Fabricate units that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- C. Form exposed sheet metal without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.
- D. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- E. Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- F. Expansion Provisions: Space movement joints at maximum of 25 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
- G. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- H. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.
- I. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.
- J. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.
  - 1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but not less than thickness of metal being secured.
- K. Aluminum Extrusion Units: Fabricate with formed or extruded-aluminum joint covers for installation behind main members where possible. Fabricate mitered and welded corner units.

## 2.5 ALUMINUM FINISHES

- A. Class I, Color Anodic Finish: Comply with AAMA 606.1 or AAMA 608.1.
  - 1. Color: As selected from full range of industry colors and densities.



## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General:
1. Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual."
  2. Anchor units of Work securely in place, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.
- B. Install exposed units that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- C. Install units to fit substrates and to result in waterproof and weather-resistant performance.
- D. Expansion Provisions: Accommodate thermal expansion of exposed sheet metal. Space movement joints at maximum of 25 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
- E. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-temper edges of sheets to be soldered to a width of 1-1/2 inches, except where pre-tempered surface would show in finished Work.
1. Do not solder aluminum and coil-coated galvanized steel sheet.
  2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
- F. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.
1. Use joint adhesive for nonmoving joints specified not to be soldered.
- G. Seams: Install flat-lock seams at nonmoving seams in aluminum. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- H. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.
1. Underlayment: Where installing stainless steel or aluminum directly on cementitious or wood substrates, install slip sheet of red-rosin paper and course of polyethylene underlayment.
  2. Bed flanges of Work in thick coat of roofing cement where required for waterproof performance.
- I. Counterflashings: Coordinate installation of counterflashings with installation of assemblies to be protected by counterflashing. Install counterflashings in reglets or receivers. Secure in a waterproof manner by means of snap-in installation and sealant, lead wedges and sealant, interlocking folded seam, or blind rivets and sealant. Lap counterflashing joints a minimum of 2 inches and bed with sealant.
- J. Roof-Drainage System: Fabricate continuous gutters. Slope to drain a minimum 1/8":12". Install drainage items fabricated from sheet metal, with straps, adhesives, and anchors recommended by SMACNA's Manual or the item manufacturer, to drain roof in the most efficient manner. Coordinate roof-drain flashing installation with roof-drainage

system installation. Provide expansion joint provisions every 50' maximum. Coordinate flashing and sheet metal items for steep-sloped roofs with roofing installation. Refer to drawings for locations and configurations. Provide new waterfall-type gutter guards at all gutters. Provide new concrete splashblock at all downspouts daylighted within 5' of the building foundation.

- K. Roof-Penetration Flashing: Coordinate roof-penetration flashing installation with roofing and installation of items penetrating roof. Refer to Section 07311 for penetration flashing requirements.
- L. Rain Diverters: Install aluminum rain diverters where indicated. Set in roof cement or sealant compatible with roofing membrane.
- M. Immediately after installation, clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

END OF SECTION 076200

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## SECTION 079200 - JOINT SEALANTS

### 1.1 GENERAL

- A. Storage and Handling: Store and handle in accordance with manufacturers instructions. Prevent from freezing. Do not store or use when temperature and conditions are outside manufacturers limits or below 40 degrees F., or when substrates are wet or damp. Protect from moisture and damage until cured.
- B. Submittals: In addition to Product Data, submit the following:
  - 1. Samples of each type and color of joint sealant required.
  - 2. Test reports for joint sealants evidencing compliance with requirements.

### 1.2 PRODUCTS

- A. Elastomeric Sealant Manufacturers: Subject to compliance with requirements, provide sealants by one of the following:
  - 1. Silicone Sealants:
    - a. Bostik Inc.
    - b. Dow Corning.
    - c. GE Silicones.
    - d. NUCO Industries, Inc.
    - e. Ohio Sealants, Inc.
    - f. Pecora Corporation.
    - g. Polymeric Systems, Inc.
    - h. Sonneborn Building Products Div., ChemRex Inc.
    - i. Tremco.
  - 2. Urethane Sealants:
    - a. Bostik Inc.
    - b. Mameco International.
    - c. W.R. Meadows, Inc.
    - d. Pacific Polymers, Inc.
    - e. Pecora Corporation.
    - f. Polymeric Systems, Inc.
    - g. Sika Corporation.
    - h. Sonneborn Building Products Div., ChemRex Inc.
    - i. Tremco.
- B. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.
- C. Colors: Provide colors indicated for exposed joint sealants or, if not indicated, as selected by Architect from manufacturer's full range for this characteristic.
- D. Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant of base polymer specified below:
  - 1. Mildew-Resistant Silicone Sealant: Type S; Grade NS; Class 25; Uses NT, G, A, and O; formulated with fungicide; intended for sealing interior joints with nonporous substrates exposed to high humidity and temperature extremes.

2. Single-Component Nonsag Urethane Sealant: Type S; Grade NS; and as follows:
  - a. Class 25.
  - b. Uses NT, M, G, A, and O.
- E. Paintable Latex Sealant: ASTM C 834.
- F. Sealant Backings, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- G. Cylindrical Sealant Backings: ASTM C 1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
  1. Type C: Closed-cell material with a surface skin.
  2. Type O: Open-cell material.
  3. Type B: Bicellular material with a surface skin.
  4. Type: Any material indicated above.
- H. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint.
- I. Primer: As recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

### 1.3 EXECUTION

- A. General: Comply with joint sealant manufacturer's instructions for products and applications indicated. Tool to a uniform, consistent shape. Remove and clean smears.
- B. Apply the indicated type of sealants to the following assemblies.
  1. Tub/shower - Silicone Sealant: Tub/tile joint, tub/flooring joint, corner of tub surround.
  2. Exterior Applications - Urethane Sealant.
  3. Interior trim - Paintable Latex Sealant: Jamb, head and sill.
- C. Sealant Installation Standard: Comply with ASTM C 1193.

END OF SECTION 079200

## SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes hollow-metal work.

#### 1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.
- C. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Amweld International, LLC.
  - 2. Apex Industries, Inc.
  - 3. Ceco Door Products; an Assa Abloy Group company.
  - 4. Commercial Door & Hardware Inc.
  - 5. Concept Frames, Inc.
  - 6. Curries Company; an Assa Abloy Group company.
  - 7. Custom Metal Products.
  - 8. Daybar.
  - 9. Deansteel.
  - 10. de La Fontaine Industries.

11. DKS Steel Door & Frame Sys. Inc.
12. Door Components, Inc.
13. Fleming-Baron Door Products.
14. Gensteel Doors Inc.
15. Greensteel Industries, Ltd.
16. HMF Express.
17. Hollow Metal Inc.
18. Hollow Metal Xpress.
19. J/R Metal Frames Manufacturing, Inc.
20. Karpen Steel Custom Doors & Frames.
21. L.I.F. Industries, Inc.
22. LaForce, Inc.
23. Megamet Industries, Inc.
24. Mesker Door Inc.
25. Michbi Doors Inc.
26. MPI Group, LLC (The).
27. National Custom Hollow Metal.
28. North American Door Corp.
29. Philipp Manufacturing Co (The).
30. Pioneer Industries, Inc.
31. Premier Products, Inc.
32. Republic Doors and Frames.
33. Security Metal Products Corp.
34. Shanahans Manufacturing Ltd.
35. Steelcraft; an Ingersoll-Rand company.
36. Steward Steel; Door Division.
37. Stiles Custom Metal, Inc.
38. Titan Metal Products, Inc.
39. Trillium Steel Doors Limited.
40. West Central Mfg. Inc.

## 2.2 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

- A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2. At locations indicated in the Door and Frame Schedule.
  1. Physical Performance: Level B according to SDI A250.4.
  2. Doors:
    - a. Type: Refer to Schedule
    - b. Thickness: 1-3/4 inches.
    - c. Face: Refer to schedule
    - d. Edge Construction: Model 1, Full Flush.
    - e. Core: Polystyrene, Polyurethane, Polyisocyanurate or Manufacturer's standard insulation material.
  3. Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than R-6 when tested according to ASTM C 1363.
  4. Frames:
    - a. Materials: Metallic-coated steel sheet, minimum thickness of 18 gauge with minimum G60 or A60 coating.
    - b. Construction: Knocked down.
  5. Exposed Finish: Prime.

## 2.3 FRAME ANCHORS

- A. Jamb Anchors:
  - 1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
  - 2. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
  - 3. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:
  - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
  - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

## 2.4 MATERIALS

- A. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B. Galvanized – G60 or A60 (Z180).
- B. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
  - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- D. Power-Actuated Fasteners in Concrete: From corrosion-resistant materials.
- E. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).
- F. Glazing: Section 088000 "Glazing."
- G. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat.

## 2.5 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
  - 1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.



- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  - 1. Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
  - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  - 3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
  - 4. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      - 1) Three anchors per jamb up to 60 inches high.
      - 2) Four anchors per jamb from 60 to 90 inches high.
    - b. Compression Type: Not less than two anchors in each frame.
    - c. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
  - 5. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
    - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
  - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
  - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
  - 1. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
  - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
  - 3. Provide loose stops and moldings on inside of hollow-metal work.
  - 4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

## 2.6 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
  - 1. Shop Primer: SDI A250.10.
- B. Finishes: Refer to Section 099113.

- C. Factory Finish: SDI A250.3.
  - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

## 2.7 ATTIC ACCESS DOORS

- A. Construction:
  - 1. Minimum Size: 22" x 36" door size.
  - 2. 16-ga. Steel frame with 20-ga. Galvanized steel door.
  - 3. Insulation – 2" mineral wool.
  - 4. Fire Rating – N/A
  - 5. Lock/ Latch – Self-latching with keyed access. Inside panel release. Spring closer for automatic closing.
  - 6. Finish – Powder coated primer. Field paint to match ceiling.

## 2.8 MEDIUM DUTY STORM DOOR

- A. Construction:
  - 1. See door schedule for door size.
  - 2. Aluminum door frame.
  - 3. ½ lite with Retractable glass/screen
  - 4. Color: To be chosen by Architect from Standard Colors
  - 5. Basis of Design: Andersen 400-Series Storm Door

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
  - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. At fire-rated openings, install frames according to NFPA 80.
    - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    - c. Install frames with removable stops located on secure side of opening.
    - d. Install door silencers in frames before grouting.
    - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    - f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    - g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
    - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
  3. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
  4. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
    - a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
    - b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
    - c. At Bottom of Door: 3/4 inch plus or minus 1/32 inch.
    - d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.
  2. Fire-Rated Doors: Install doors with clearances according to NFPA 80. Provide UL labeling of the door assembly in accordance with NFPA 80 and in accordance with OBC.
- C. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

### 3.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- C. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- D. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

## SECTION 081416 - FLUSH WOOD DOORS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes Solid Core Composite doors as follows:
  - 1. Flush Pre-hung Series doors.
- B. See 062023 Interior Finish Carpentry for interior door trim.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of door. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details; location and extent of hardware blocking; mortises, holes, and cutouts; and other pertinent data.
- C. Samples: For each face material and finish.

#### 1.3 QUALITY ASSURANCE

- A. Quality Standard: Comply with NWWDA I.S.1-A, "Architectural Wood Flush Doors."

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers:
  - 1. Masonite International Corporation.
  - 2. Mohawk Flush Doors, Inc.
  - 3. Oshkosh Door Company
  - 4. VT Industries, Inc.

#### 2.2 DOOR CONSTRUCTION GENERAL

- A. Solid Core Interior Pre-Hung Doors:
  - 1. Grade: High Density Fiberboard, Solid Core.
  - 2. Facings- Molded Wood Fiber Facings
  - 3. Style: refer to door schedule
  - 4. Height/Width- Refer to door schedule on drawings.
  - 5. Bottom Rail: Composite
  - 6. Top Rail: Composite with edge band.
  - 7. End Rail: Composite with edge band and hinge/lock stile.

- B. Fire-Rated Wood Doors: Labeled by a testing and inspecting agency acceptable to authorities having jurisdiction based on testing at positive pressure according to NFPA 252 or UL 10C.
  - 1. Where indicated, provide doors that have a temperature rise rating of 450 deg F (250 deg C).
  - 2. Provide core specified or mineral core as needed to provide fire-protection rating indicated.
- C. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.
- D. Particleboard-Core Doors: Provide blocking in particleboard cores or provide structural composite lumber cores instead of particleboard cores for doors with exit devices or protection plates.
- E. Mineral-Core Doors: Provide the following:
  - 1. Composite blocking where required to eliminate through-bolting hardware.
  - 2. Laminated-edge construction.
  - 3. Formed-steel edges and astragals for pairs of doors.

## 2.3 FLUSH WOOD DOORS

- A. Doors for Opaque Finish:
  - 1. Interior Solid-Core Doors: Custom grade, three-ply, particleboard cores.
    - a. Faces: Any closed-grain hardwood.

## 2.4 FABRICATION AND FINISHING

- A. Factory-fit doors to suit frame-opening sizes indicated and to comply with clearances specified.
- B. Factory-machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3.
- C. Cut and trim openings to comply with referenced standards.
  - 1. Factory-install louvers in prepared openings.
- D. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.
  - 1. Louvers: Where indicated, factory install louvers in prepared openings. Louvers shall be manufacturer's standard metal louvers, min. 18"w.x 12"h. Louvers shall be factory-finished. Color to be selected.
- E. Factory-finish doors indicated for transparent finish with stain and manufacturer's standard finish complying with WDMA TR-4, conversion varnish or WDMA TR-6, catalyzed polyurethane for grade specified for doors.
  - 1. Sheen: Satin.
- F. Factory-finish doors indicated for opaque finish with manufacturer's standard finish complying with WDMA OP-4, conversion varnish or WDMA OP-6, catalyzed polyurethane for grade specified for doors.
  - 1. Sheen: Satin.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install doors to comply with manufacturer's written instructions and WDMA I.S.1-A, and as indicated.
  - 1. Install fire-rated doors to comply with NFPA 80.
  - 2. Install smoke- and draft-control doors according to NFPA 105.
- B. Align and fit doors in frames with uniform clearances and bevels. Machine doors for hardware. Seal cut surfaces after fitting and machining.
- C. Clearances: As follows unless otherwise indicated:
  - 1. 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors.
  - 2. 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering.
  - 3. 3/4 inch (6.4 mm) maximum from bottom of door to top of threshold.
  - 4. Comply with NFPA 80 for fire-rated doors.

END OF SECTION 081416

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## SECTION 082200 – FIBERGLASS DOORS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Fiberglass Exterior Entry Doors.
  - 2. Wood furring, blocking, shims, and hanging strips for installing.
  - 3. Wood/Composite door frames.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: Product Data: For each type of product.
- B. Shop Drawings: Show location of paneling, large-scale details, attachment devices, and other components. Include dimensioned plans and elevations.
- C. Samples:
  - 1. Color chips and door sample.

#### 1.3 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install paneling until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

### PART 2 - PRODUCTS

#### 2.1 FIBERGLASS DOOR SLABS- Pre-hung with hinges, weather-stripping and adjustable sill.

- A. Approved manufacturers:
  - 1. Jeld-Wen Doors
  - 2. Masonite
  - 3. Pease
  - 4. Approved equal
- B. Fiberglass Skins: Long fiber injection (LR) Technology, incorporating multiple layers of resins, tinted resins, base colors and reinforcing materials.
- C. Stiles and Rails: Engineered wood (laminated veneer lumber).
- D. Core: Polyurethane core. Energy Efficient
- E. Thickness: 1-3/4 inch.



- F. Door Style: Refer to drawings. (Refer to schedule for glazing).
- G. Door Shape: Squared top.
- H. Finish: Woodgrain pattern. Doors shall be painted. Architect to select color.
- I. Hardware: Prepare door and install hardware. See Drawings and Section 08711.

## 2.2 PREHUNG FRAME

- A. Profile: Single Door.
- B. Jamb Construction: No rot solid wood with composite jamb. Treated to prevent deterioration.
- C. Casing: PVC Composite, no rot.
- D. Hinges: Stainless steel concealed-bearing. 4"x4" square. Satin Nickel finish.
- E. Sills: Aluminum. Polished aluminum finish.

## 2.3 INSTALLATION MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls.

# PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Remove existing doors, frames, trim, and thresholds. Salvage locks for re-use/ installation in new doors.
- B. Replace damaged framing. See Allowances.

## 3.2 INSTALLATION

- A. Install door frames plumb and level. Shim as required.
- B. Install threshold.
- C. Install door and frames in accordance with manufacturer's printed instructions.
- D. Install hardware
- E. Install trim on exterior and interior sides of doors.
- F. Paint door, frame and trim. See Section 09912.

END OF SECTION 08161

## SECTION 085413 – FIBERGLASS/COMPOSITE WINDOWS

### PART 1 - GENERAL

#### 1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, and color Samples.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Basis of Design: Andersen Windows, Inc. 100 Series ,Fibrex Composite/Fiberglass, fixed and gliding Windows.

#### 2.2 PERFORMANCE REQUIREMENTS

- A. Product Standard: AAMA/WDMA/CSA/NAFS.
  - 1. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
  - 2. Window Certification: WDMA or NAFS certified with label attached to each window.
- B. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.25 Btu/sq. ft. x h x deg F (2.0 W/sq. m x K).
- C. Air Infiltration Rate: Less than 0.2 cfm/square feet.
- D. Environmental Certifications – Energy Star rated.
- E. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.27.
- F. Windborne-Debris Resistance: Windows pass basic-protection testing requirements in ASTM E 1996 for Wind Zone 1 when tested according to ASTM E 1886.
- G. Manufacturer's Warranty: Manufacturer agrees to repair or replace fiberglass windows that fail in materials or workmanship within specified warranty period:
  - 1. Failures include, but are not limited to, the following:
    - a. Failure to meet performance requirements.
    - b. Structural failures including excessive deflection, water leakage, and air infiltration.
    - c. Faulty operation of movable sash and hardware.
    - d. Deterioration of materials and finishes beyond normal weathering.
    - e. Failure of insulating glass.

2. Warranty Period:

- a. Window: 5 years from date of Substantial Completion.
- b. Glazing Units, Non-Laminated: 20 years from date of Substantial Completion.
- c. Glazing Units, Laminated: 10 years from date of Substantial Completion.

2.3 FIBERGLASS WINDOWS

- A. Window Types: The following types, as indicated on Drawings:
  1. Glider.
  2. Fixed.
- B. Frames and Sashes: Fibrex® Vinyl and wood composite complying with AAMA/WDMA/CSA 101 /I.S.2/ A440 and with exposed exterior fiberglass surfaces finished with manufacturer's standard polymer coating.
  1. Exterior Color: Factory finished. White.
  2. Exterior Flange: 1 3/8" Flange Setback
  3. Interior Finish: Match exterior.
  4. Weatherstripping: Polypropylene fins and pile.
- C. Trim: Provide indicated trim, matching material, and finish of frame members.
- D. Hardware – Provide windows with the following:
  1. Glider windows: lock cover reach range #9130383 for all latches in excess of 4'-0" a.f.f. Provide optional sash lift/pull handle 9130443
  2. Fixed clubhouse windows: standard hardware
- E. Provide steel sash rollers for sliding windows.
- F. Insect Screens - Equip units with aluminum framed factory finished to match exterior color with stainless steel wire mesh insect screens at operable sashes.
- G. Glaze units with: Annealed glass, ASTM C1036, clear, low-E-coated-SmartSun™, argon-filled, dual-pane sealed insulating glass with polyisobutylene primary seal, silicone secondary seal and stainless-steel spaces. Maximum U-value 0.27,
- H. Grilles: Finelight grilles between-the-glass. Color to match window frames. Prairie A. Refer to drawings.
- I. Accessories:
  1. Interior Stools – ½" thick solid surface (acrylic or polyester resin) with a ¾" projection beyond the face of the interior wall.
  2. Window Treatments – 2" no-sag vinyl slat min-blinds. Cordless lift with wand tilt, slat valance, no holes at slats. Lead-free. Maximum width 36" – Provide paired blinds on single headrail where window width exceeds 36".

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Set units level, plumb, and true to line, without warp or rack of frames and panels. Provide proper support and anchor securely in place.
- B. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- C. Install interior window stools per details.
- D. All voids at window perimeter shall be sealed with low-expansion spray foam after installation and prior to applying interior trim and finishes.
- E. Provide flashing as indicated on drawings and in manufacturer's printed installation instructions. At a minimum, all heads, jambs, and sills shall receive butyl tape flashing.
- F. Set sill members in bed of sealant or with gaskets, as indicated, to provide weathertight construction.
- G. Adjust operating panels, screens, and hardware to provide a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.
- H. Clean glass and frame surfaces immediately after installing windows. Remove nonpermanent labels from glass surfaces.
- I. Install new window treatments in accordance with manufacturer's printed instructions.

END OF SECTION 085413

## SECTION 087111 DOOR HARDWARE

### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Hinges.
  - 2. Cylinders latches
  - 3. Deadbolt locks
  - 4. Thresholds
  - 5. Door stops
  - 6. Latches

### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Samples: For each exposed finish.
- C. Door Hardware Schedule: Organized into door hardware sets indicating type, style, function, size, label, hand, manufacturer, fasteners, location, and finish of each door hardware item.
- D. Product certificates.

### 1.3 QUALITY ASSURANCE

- A. Supplier Qualifications: Person who is or employs a qualified DHI Architectural Hardware Consultant.
- B. Source Limitations: Obtain door hardware that is compatible with CMHA standard keying system.
- C. Keying Conference: Conduct conference at Project site. Incorporate conference decisions into final keying schedule.
- D. Conform to American Disabilities Act requirements.
- E. Templates: Obtain and distribute templates for doors, frames, and other work specified to be factory prepared for installing door hardware.

### 1.4 PRODUCT HANDLING

- A. Package hardware, on set-by-set basis, is the responsibility of the supplier. As material is received by the supplier from the various manufacturers (except hinges) sort and repackage in containers marked with the hardware set number.
  - 1. Clearly mark packaged sets of hardware with door opening number on outside of package.
  - 2. All hinges to be shipped separate from packaged sets.

## PART 2 - PRODUCTS

## 2.1 HINGES

- A. Clubhouse Door Hinges and Exterior Unit Door Hinges: Four hinges per door installed in CMU walls. Three hinges per door at all other locations. 4 ½"x4 ½" 10 gauge reinforcement, Stainless steel. Approved manufacturers: Stanley Hardware, Schlage, Hager or Yale.
- B. Interior Unit Door Hinges: Three hinges per door. 3 ½" mortised, polished steel. Approved manufacturers: Stanley Hardware, Schlage, Hager or Yale.
- C. Screws: Phillips flat-head machine screws except furnish Phillips flat-head wood screws for installation into wood. Screw finish to match hinge.
- D. Hinge Pins: Exterior doors, non-removable pins. Interior doors, non-rising pins (unless noted otherwise).

## 2.2 LOCKSET AND LATCH STANDARDS

- A. Standards:
  - 1. BHMA A156.2, Series 4000, Grade 1 for bored locks and latches.
  - 2. BHMA A156.3, Grade 1 for exit devices.
  - 3. BHMA A156.5, Grade 1 for auxiliary locks.
  - 4. BHMA A156.12, Series 5000, Grade 1 for interconnected locks and latches.
  - 5. BHMA A156.13, Series 1000, Grade 1 for mortise locks and latches.
  - 6. Lever handles on locksets and latchsets.
  - 7. Provide trim on exit devices matching locksets.
- B. Key locks to Owner's master-key system.
  - 1. Cylinders with six-pin tumblers.
  - 2. Schlage style cores.

## 2.3 LOCKSETS

- A. Apartment Doors – See hardware schedule:
  - 1. Deadbolt Lock – Thumb-turn, 6-pin removable core, Grade 1.
  - 2. Passage Latch – (Exterior) Passage function. Lever handles. Grade 1.
  - 3. Passage Latch – (Closets) Passage function. Lever handles. Grade 2.
  - 4. Privacy Locking Latch – (Bedroom & Bath). Privacy function. Lever handles. Grade 2.
- B. Clubhouse Doors – See hardware schedule:
  - 1. Deadbolt Lock – Thumb-turn, 6-pin removable core, Grade 1.
  - 2. Passage Latch – Passage function. Lever handles. Grade 1.
  - 3. Classroom Latch – Classroom function, 6-pin removable core, Lever handles. Grade 1.
- C. Strikes Plates: Strikes to match hardware. Provide strikes and dust boxes at all doors.

## 2.4 DOOR TRIM

- A. Door Stops: Provide floor stops at base of all doors, unless wall or other type stops are scheduled or indicated. IVES FS 438 or equal; Ives FS 434 at undercut doors.

- B. Door kicks: Provide minimum 10"x36" stainless steel door kick at the bottom of both sides of doors. Secure with minimum 8 stainless steel screws.
- C. Finish and Base Metal: Unless otherwise specified provide US26D (626) Brushed chrome plated finishes and base metals.

## 2.5 DOOR GASKETING AND THRESHOLDS

- A. Door Gasketing: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior fire rated doors. Provide non-corrosive fasteners for exterior applications and elsewhere as indicated.
  - 1. Air Leakage: Not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283.
  - 2. Sound-Rated Gasketing: Assemblies that are listed and labeled, based on testing according to ASTM E 1408.
  - 3. Gasketing Materials: Comply with ASTM D 2000 and AAMA 701/702.
- B. Thresholds & Weather-stripping: Provide thresholds and weather-stripping as indicated below:
  - 1. Exterior Doors: Provide Hager 421S, 26D finish or equal.
  - 2. Clubhouse exterior doors: Provide Hager 740S automatic door bottom, Hager 896S head and strike jamb and Hager 880S hinge jamb (color to match other hardware) or comparable product manufactured by: Pemko or Stanley.
- C. MISCELLANEOUS DOOR HARDWARE
  - 1. Peep Holes: 200-degree polished brass door viewer. US3 finish Brainard by Pease or equal. Meeting ANSI 156.16-L13211. UL listed. Hager 1756 or comparable product manufactured by: Schlage or Stanley. Mount two (2) peep holes; one at 60" AFF and one at 43" AFF for all non-glazed exterior unit doors.
  - 2. Door Closer: Norton 9300BC Series. Provide closer designed for door handing and mounting.
  - 3. Exit Device: Hager 4700 36-inch Steel Universal Reversible Rim Exit Device. Provide trim and lock function per schedule. Finish to be 626. Provide leverset trim and key lock.
  - 4. Push Plate: Ives 8200-626-3x12-STD 1-3/4" or equal – Satin Chrome, 3"x12", with standard mounting hardware.
  - 5. Pull Plate: Ives 8300-626-3x12-STD 1-3/4" or equal – Satin Chrome, 3"x12", with standard mounting hardware.

## 2.6 FABRICATION

- A. Base Metals: Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials if different from specified standard.
- B. Fasteners: Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated. Provide steel machine or wood screws or steel through bolts for fire-rated applications.
- C. Spacers or Sex Bolts: For through bolting of hollow metal doors.

- D. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, "Recommended Fasteners for Wood Doors."
- E. Finishes: Comply with BHMA A156.18.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Examine doors and frames for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- B. When installing door latches/locks, install strike plates with plate compatible with new latch/lock hardware.
- C. When installing door viewers (peeps) locate such that the screen door does not block the view.
- D. When installing door stops secure to floor structure.
- E. Where kick plates are required, provided on both sides of door leaf with top no more than 16" AFF.
- F. Steel Door and Frame Preparation: Comply with DHI A115 series. Drill and tap doors and frames for surface-applied hardware according to SDI 107.
- G. Wood Door Preparation: Comply with DHI A115-W series.
- H. Mounting Heights: Comply with the following requirements, unless otherwise indicated:
  - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  - 2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
  - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
  - 4. Accessibility: All accessible doors shall comply with ADAAG Guidelines.
- I. Adjust and reinforce attachment substrates as necessary for proper installation and operation. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
  - 1. Thresholds: Set thresholds for exterior doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

END OF SECTION



## SECTION 092900 - GYPSUM BOARD ASSEMBLIES

### 1.1 GENERAL

- A. This Section includes the following:
  - 1. Interior gypsum wallboard.
  - 2. Corner guards.
- B. Reference specification Section 018113 for LEED Requirements.
  - 1. Gypsum wallboard materials shall contain a recycled content of 95%.

### 1.2 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.

### 2.0 PRODUCTS-INTERIOR GYPSUM BOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.
  - 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:
  - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. American Gypsum Co.
    - b. BPB America Inc.
    - c. G-P Gypsum.
    - d. Lafarge North America Inc.
    - e. National Gypsum Company.
    - f. PABCO Gypsum.
    - g. Temple.
    - h. USG Corporation.
- B. Regular Type:
  - 1. Thickness: 1/2 inch or as indicated on Drawings.
  - 2. Long Edges: Tapered.
- C. Type X:
  - 1. Thickness: 5/8 inch, where indicated on Drawings.

2. Long Edges: Tapered.
- D. Ceiling Type: Manufactured to have more sag resistance than regular-type gypsum board.
1. Thickness: 1/2 inch, non-sag, or as indicated on Drawings.
  2. Long Edges: Tapered.
- E. Moisture- and Mold-Resistant Type: With moisture- and mold-resistant core and surfaces.
1. Core: 1/2 inch, Type X 5/8" where indicated on Drawings.
  2. Long Edges: Tapered.
- G. Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C 1047, formed metal complying with the following requirement:
1. Steel sheet zinc coated by hot-dip process or rolled zinc.
- H. Joint Treatment Materials: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
1. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.
    - a. Use pressure-sensitive or staple-attached, open-weave, glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.
  2. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.
    - a. Ready-Mixed Formulation: Factory-mixed product.
- I. Miscellaneous Materials: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
1. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum panels.
  2. Fastening Adhesive for Wood: ASTM C 557.
  3. Steel drill screws complying with ASTM C 1002 for the following applications:
    - a. Fastening gypsum board to steel members less than 0.033 inch thick.
    - b. Fastening gypsum board to wood members.
  4. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch thick.
  5. Steel drill screws of size and type recommended by unit manufacturer for fastening cementitious backer units.
  6. Gypsum Board Nails: ASTM C 514.
  8. Polyethylene Vapor Retarder: ASTM D 4397, thickness and maximum permeance rating as follows:
    - a. 6 mils, 0.13 perms.
  9. Vapor Retarder Tape: Pressure-sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.
- F. Corner Guards: Heavy-duty retainer clip with vinyl cover and end caps. Wings shall be min 3" and length shall be min 3' length. Color to be selected from manufacturer's full range.  
<https://www.wallguard.com/corner-guards/high-impact-corner-guards/vinyl-corner-guards.html>

### 3.0 EXECUTION

3.1 General: Provide new drywall assemblies. Refer to wall partition details.

- A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.
1. Maintain required fire separation assemblies where required between units. Install sound batts.
  2. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
  3. Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
  4. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.
    - a. Space screws a maximum of 12 inches o.c. for vertical applications.
  6. Install moisture-resistant panels at bathrooms, behind washer boxes and where indicated (Cement board at shower surrounds). Install with 1/4-inch open space where panels abut other construction or penetrations.
  7. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:
    - a. Fasten with screws.
- B. Installing Trim Accessories: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.
1. Install cornerbead at external corners.
  2. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.
    - a. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
    - b. Install L-bead where edge trim can only be installed after gypsum panels are installed.

### 1.3 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: (embed tape in joint compound) Ceiling plenum areas, concealed areas, smoke partitions, and where indicated.
2. Level 2: (embed tape in joint compound, apply one coat of joint compound without excess joint compound – tool marks and ridges are acceptable provided they don't interfere with finish). Panels that are substrate for tile and Where indicated on Drawings.
3. Level 3: (embed tape in joint compound, apply two coats of joint compound and finish smooth – ready for paint). All gypsum exposed to view.
6. Finish water-resistant gypsum backing board to comply with ASTM C 840 and gypsum board manufacturer's directions.
7. Finish cementitious backer units to comply with unit manufacturer's directions.

1.4 CORNER GUARDS

- A. Furnish and install corner guards on all outside corners throughout the unit.
- B. Install corner guards per manufacturer's written instructions.
- C. Set bottom of guard at the top of the wall base.

END OF SECTION 092900

## SECTION 093000 - CERAMIC TILE

### 1.1 GENERAL

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
  - 1. Level Surfaces: Minimum 0.6.
- B. Extra Materials: Deliver to Owner not less than one box for each 25 boxes or fraction thereof, of each class, wearing surface, color, pattern and size of ceramic tile.
- C. Submittals: In addition to Product Data for each type of tile and setting material indicated, submit the following:
  - 1. Samples of each type and composition of tile and for each color and texture required, at least 12 inches square, mounted on braced cementitious backer units, and with grouted joints.

### 1.2 PRODUCTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Tile Products:
    - a. American Marrazzi Tile, Inc.
    - b. American Olean Tile Company.
    - c. Buchtal Corporation USA.
    - d. Cerim-Floor Gres Ceramiche.
    - e. Crossville Ceramics.
    - f. Dal-Tile Corporation.
    - g. Florida Tile Industries, Inc.
    - h. GranitiFiandre.
    - i. Interceramics, USA.
    - j. KPT, Inc.
    - k. Laufen International, Inc.
    - l. Lonestar Ceramics Company.
    - m. Mannington Ceramic Tile.
    - n. Metropolitan Ceramics.
    - o. Monarch Tile, Inc.
    - p. Quarry Tile Company.
    - q. Seneca Tiles, Inc.
    - r. Summitville Tiles, Inc.
    - s. United States Ceramic Tile Company.
  - 2. Tile-Setting and -Grouting Materials:
    - a. American Olean Tile Company.
    - b. Atlas Minerals & Chemicals, Inc.
    - c. Boiardi Products Corporation.
    - d. Bonsal: W.R. Bonsal Company.
    - e. Bostik.
    - f. C-Cure Corporation.
    - g. Custom Building Products.
    - h. Dal-Tile Corporation.
    - i. DAP, Inc.
    - j. Laticrete International, Inc.

- k. Mapei Corporation.
  - l. Southern Grouts & Mortars, Inc.
  - m. Summitville Tiles, Inc.
  - n. TEC Incorporated.
- B. ANSI Ceramic Tile Standard: Provide tile that complies with Standard Grade requirements of ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
- C. ANSI Standards for Tile Installation Materials: Provide materials complying with referenced ANSI standards.
- D. Colors, Textures, and Patterns: For tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, comply with the following requirements:
  - 1. Provide Architect's selections from manufacturer's full range of colors, textures, and patterns for products of type indicated.
- E. Factory Blending: For tile exhibiting color variations within the ranges selected during Sample submittals, blend tile in the factory and package so tile units taken from one package show the same range in colors as those taken from other packages and match approved Samples.
- F. Unglazed Ceramic Floor Tile: Provide factory-mounted flat tile complying with the following requirements:
  - 1. Composition: Porcelain.
  - 2. Nominal Thickness: 1/4 inch.
  - 3. Modular Size: 2-inch x 2-inch
  - 4. Face: Plain with cushion edges.
  - 5. Tile Color and Pattern: As selected by Architect from manufacturer's full range.
- G. Trim Units: Provide tile trim units to match characteristics of adjoining flat tile and to comply with the following requirements:
  - 1. Size: As indicated, coordinated with sizes and coursing of adjoining flat tile where applicable.
- H. Setting Materials: As follows:
  - 1. Latex-Portland Cement Mortar: Contractor's option. ANSI A118.4, composed as follows:
    - a. Prepackaged Dry-Mortar Mix: Factory-prepared mixture of portland cement; dry, redispersible, ethylene vinyl acetate additive; and other ingredients to which only water needs to be added at Project site.
    - b. Mixture of Dry-Mortar Mix and Latex Additive: Mixture of prepackaged dry-mortar mix and liquid-latex additive complying with the following requirements:
      - 1) Latex Additive: Acrylic resin.
- I. Grouting Materials: As follows:
  - 1. Latex-Portland Cement Grout: ANSI A118.6 for materials described in Section H-2.4, composed as follows:
    - a. Factory-Prepared, Dry-Grout Mixture: Factory-prepared mixture of portland cement; dry, redispersible, ethylene vinyl acetate additive; and other ingredients to produce the following:
      - 1) Unsanded grout mixture for joints 1/8 inch and narrower.
      - 2) Sanded grout mixture for joints 1/8 inch and wider.
    - b. Mixture of Dry-Grout Mix and Latex Additive: Mixture of factory-prepared, dry-grout mix and latex additive complying with the following requirements:

- 1) Unsanded Dry-Grout Mix: Dry-set grout complying with ANSI A118.6 for materials described in Section H-2.3, for joints 1/8 inch and narrower.
  - 2) Sanded Dry-Grout Mix: Commercial portland cement grout complying with ANSI A118.6 for materials described in Section H-2.1, for joints 1/8 inch and wider.
  - 3) Latex Additive: Acrylic resin.
2. Grout Sealer – Laticrete or approved equal grout sealer fully compatible and as recommended by grout and tile manufacturer.
3. Grout for PregROUTed Tile Sheets: Same silicone rubber used in factory to pregROUT tile sheets.
- J. Elastomeric Sealants: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements of Division 7 Section "Joint Sealants."
  1. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide.
- K. Cementitious Backer Units: Provide products complying with ANSI A118.9, of thickness and width indicated, and in maximum lengths available to minimize end-to-end butt joints.
  1. Cement-Coated Portland Cement Panels: High-density portland cement surface coating on both faces and lightweight concrete core composed of portland cement and expanded ceramic aggregate; fabricated in panels 7/16-inch thick by 36 inches wide, weighing 3.2 - 3.8 psf.
  2. Mortar Unit Finishing Materials: Tape and joint compounds as recommended by manufacturer of cementitious backer units.
- L. Miscellaneous Materials: Provide the following materials:
  1. Trowelable Underlayments and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- M. Thresholds: Fabricate to provide transition between adjacent floor finishes. Bevel edges at 1:2 slope, limit height of bevel to 1/2 inch or less, and finish bevel to match face of threshold.
  1. 2" Marble threshold at bathroom door.
- N. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.

### 1.3 EXECUTION

- A. Install ceramic tile where indicated on Drawings and in accordance with this Section.
  1. Field-Applied Temporary Protective Coating: If necessary to protect floor grout or mortar until cured, provide reusable Masonite covering over traffic areas until mortar grout cures. Temporarily secure and otherwise eliminate trip or fall hazards.
- B. ANSI Tile Installation Standards: Comply with parts of ANSI A108 series of tile installation standards in "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated.
- C. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated.
- D. Extend tile work into recesses and under or behind equipment, casework and fixtures to form a complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

- E. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- F. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints where adjoining tiles on floor, base, walls, and trim are the same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
- G. Floor Tile Installation: Install tile to comply with requirements indicated, including those referencing TCA installation methods and ANSI A108 series of tile installation standards.
  - 1. Joint Widths: Install tile on floors with the following joint widths:
    - a. Ceramic Tile: 1/16 inch.
  - 2. Back Buttering: For installations indicated, obtain 100 percent mortar coverage by complying with applicable special requirements for back buttering of tile in referenced ANSI A108 series of tile installation standards.
- H. Sealing: After grout has cured, clean surface and apply grout sealer in accordance with manufacturer's instructions.
- I. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter. Use cleaning materials and methods that comply with tile and grout manufacturers' written instructions.
  - 1. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to brick and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

END OF SECTION 093000



SECTION – 096519.23 LUXURY VINYL TILE (LVT)

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Resilient tile flooring as shown on the drawings and schedules and as indicated by the requirements of this section.

1.02 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract (including General and Supplementary Conditions and Division 1 sections) apply to the work in this section only.

1.03 RELATED SECTIONS

- A. Specifications Section 018113 Sustainable Design requirements for LEED requirements
- B. Other Division 9 sections for floor finishes related to this section but not the work of this section.
- C. Division 3 Concrete - not included work this section.
- D. Division 6 Wood and Plastics - not included work this section.

1.04 QUALITY ASSURANCE AND REGULATORY REQUIREMENTS

- A. Qualifications of Installers: All work shall be done by installation firms specializing in commercial LVT installation. It is required, that the firm or individual shall be a member of the Floor Covering Installation Contractors Association (FCICA) and/or certified by the Certified Floorcovering Installers Association (CFI). Flooring contractor to be specialty contractor normally engaged in this type of work and shall have three (3) years minimum documented experience in commercial installation of these materials and participation in manufacturer's environmental program including responsible carpet removal, recycling, and installation.
- B. Flooring contractor will be responsible for the proper product installation, including floor preparation in all the areas indicated in the drawings to receive LVT.
- C. Flooring contractor to provide owner a written warranty that guarantees the completed installation to be free from defects in materials and workmanship for a period of no less than two (2) years after job completion.
- D. All warranties must be issued by the manufacturer as standard published warranties on all types of LVT within this document. Second source warranties that involve parties other than the LVT manufacturer are unacceptable. If the product fails to perform as warranted when installed according to the manufacturer's installation instructions and maintained according to maintenance instructions, the affected area will be repaired or replaced at the expense of the manufacturer. The LVT manufacturer will provide standard published written performance warranties for the following:
  - 1. A Ten (10) Year warranty on manufacturing defects and a Ten (10) year wear warranty stating that product will not wear through (damage or affect) the printed film layer due to normal traffic. Manufacturer will pay all reasonable labor costs (these costs will be determined by manufacturer).

- E. Provide flooring material to meet the following test performance criteria as tested by a recognized independent testing laboratory. Certified test reports shall be submitted by the carpet manufacturer for each test method. Requirements listed below must be met by all products being submitted for approval:
1. Materials: Phthalates Free
  2. Indoor Air Quality: FloorScore® Certified
  3. LEED v4: Contributes to IAQ: Low Emitting Materials
  4. Recycled Content : 20% post-consumer or 50% pre-consumer
  5. End of Life: 100% Recyclable
  6. Class / ASTM F1700: Class III Printed Film Vinyl Plank - Type B (embossed)
  7. Flooring Radiant Panel: Class 1
  8. ADA Compliance: Compliant For Accessible Routes
  9. ASTM F2055 (Size and Tolerance): Passes
  10. ASTM F386 (Thickness): Passes
  11. ASTM F1914 (Residual Indentation): Passes
  12. ASTM F137 (Flexibility): Passes
  13. ASTM F2199 (Dimensional Stability): Passes
  14. ASTM F925 (Chemical Resistance): Passes
  15. ASTM F1514 (Resistance to Heat): Passes
  16. ASTM F1515 (Resistance to Light): Passes
  17. ASTM E648 (Critical Radiant Flux): Passes
  18. ASTM E662 (Optical Smoke Density): Passes
  19. ASTM C1028 (Slip Resistance): Passes
  20. ASTM F970 (Static Load): Passes

#### 1.05 SUBMITTALS

- A. Submit two (2) finished samples of the exact type of LVT proposed, including quality, pattern, and color.
- B. Submit manufacturer's warranties, installation instructions, and maintenance instructions
- C. Submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests as well as the test listed under 1.04 F.

#### 1.06 ENVIRONMENTAL/FIELD CONDITIONS

- A. Deliver all materials to the installation site in the manufacturer's original packaging and in good condition. Packaging to contain manufacturer's name and marks, identification number, shipping and handling instructions and related information
- B. Delivered and stored materials must be available for inspection as required by the owner, architect, general contractor, and/or the manufacturer.
- C. Sub-floor preparation is to include all required work to prepare new concrete surfaces for installation of the product as specified in this document. Sub-floor preparation shall meet all conditions as specified in manufacturer's installation instructions.
- D. The building must be enclosed and the HVAC in continuous operation. The LVT and adhesive must be conditioned to room temperature for 3 days prior to installation, during the installation and continuous following completion of the installation. The ambient air relative humidity must be between 10%-65% with the floor and room temperature between 55- 85 degrees Fahrenheit. The indoor temperature should never fall below 55 degrees Fahrenheit or above 85 degrees Fahrenheit regardless of the age of the installation.

- E. Store cartons of tile or plank products flat and squarely on top of one another. Preferably, locate material in the "center" of the installation area (i.e. away from vents, direct sun- light, etc.) Storing cartons in direct sunlight may affect proper acclimation by inducing thermal expansion/contraction.

#### 1.07 SUBSTITUTIONS

- A. All Bid submittals must conform to the specifications in this document.
- B. All test results to be in accordance with a certified independent testing laboratory.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Acceptable Manufacturer:
  - 1. A ten (10) year warranty on manufacturing defects and a ten (10) year wear warranty stating that product will not wear through (damage or affect) the printed film layer due to normal traffic. If a verified material failure occurs, the manufacturer will pay 100% of all reasonable labor costs for the warranty period (these costs will be determined by manufacturer).
  - 2. Tarkett 30000Aurora Rd. Solon, Oh 44139. (800) 899-8916. [commercial.tarket.com](http://commercial.tarket.com).
  - 3. Any manufacturer and/or product must meet or exceed those requirements specified under all sections of this document in pattern, color, and format. Any substitutions must be made in accordance with Section 1.00 of this document.

#### 2.02 FLOORING MATERIALS

- A. Luxury Vinyl Tile Wood Look (all rooms except kitchen and bath):
  - 1. Product: Tarkett Latitude – Color to be selected
  - 2. Thickness: 3mm
  - 3. Wear Layer: 20 Mil
  - 4. Finish / Coating: Enhanced UV Urethane w/ Ceramic Bead
  - 5. Ceramic bead with immersion rate greater than 5 grams/sf
  - 6. Pattern Repeat: Random
  - 7. Dimensions: 6" x 48"
  - 8. Backing Class: Commercial Grade
  - 9. Commercial Traffic: Heavy Commercial
- B. Luxury Vinyl Tile: Stone Look (kitchen only):
  - 1. Product: Tarkett Latitude – Color to be selected
  - 2. Thickness: 3mm
  - 3. Wear Layer: 20 Mil
  - 4. Finish / Coating: Enhanced UV Urethane w/ Ceramic Bead
  - 5. Ceramic bead with immersion rate greater than 5 grams/sf
  - 6. Pattern Repeat: Ashlar
  - 7. Dimensions: 12" x 24"
  - 8. Backing Class: Commercial Grade
  - 9. Commercial Traffic: Heavy Commercial



2.03 ADHESIVES

- A. Tarkett Modular/ LVT pressure sensitive adhesive or manufacturer's approved adhesive.

2.04 WALL BASE

- A. Resilient Wall Base- ASTM F 1861- wall base height 6" and 4" (refer to drawings). Type TV, Group I or II, Style to be cove with top set toe. Minimum thickness 0.125" cut lengths 48" or coils in manufacturer's standard length. Outside & Inside corners to be job formed or pre-molded, surfaces to be smooth.
  - 1. Johnsonite
  - 2. Armstrong World Industries, Inc.
  - 3. Congoleum Corporation,
  - 4. Azrock Commercial Flooring

2.04 ACCESSORIES

- A. Provide transition/reducing strips tapered to meet abutting materials as indicated in the drawings (if required).
- B. Provide edge strips made of extruded aluminum with a mill finish, unless otherwise noted.
- C. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement-based or blended hydraulic cement- based formulation provided or approved by flooring manufacturer for applications indicated.
- D. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
- E. Heat welded bead: Solid-strand product of floor covering manufacturer-color to match floor covering.
- F. Transitions – Provide appropriate transition fitting as manufactured by Johnsonite or approved equal. Color as selected by Architect from manufacturer's standards.

PART 3 EXECUTION

3.01 INSPECTION

- A. Examine and verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive flooring.
- B. Verify that concrete sub-floor surfaces are dry enough and ready for flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F 710; obtain instructions if test results are not within limits recommended by carpet manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. SURFACE PREPARATION – Dirt, grime, dust, debris and noncompatible adhesive must be removed before the installation begins. Surfaces must be smooth and level with all holes and cracks filled with Portland cement-based patch reinforced with polymers or primed with Premium Sealer.

3.03 SUBFLOORS:

- A. Concrete – Concrete must be checked for moisture. Dry, dusty, porous floors must be primed; primers will not correct a moisture problem.

3.04 INSTALLATION OF FLOORING

1. See Products for type of LVT and location of installation.
2. Follow manufacture's printed installation instructions and procedures to maintain warranties and for proper installation.
3. Install LVT using conventional tile and plank installation techniques. Plank products should have a minimum of 6-8" seam stagger.
4. Carefully determine where to begin tile or plank installation.
5. It is customary to center the rooms and hallways, so borders are not less than half a tile or plank.
6. Working out of multiple boxes at a time is recommended.
7. Make sure cut edges are always against the wall.
8. To properly cut LVT/LVP products score the top side of the material with a utility knife. Bend the product and finish the cut through the backside. This will ensure the cleanest cut. It may be necessary to use a heat gun to cut around vertical obstructions. Allow the heated LVT/LVP to return to room temperature before installation.
9. Cutting the product into a fine point may lead to delamination. Use an ethyl cyanoacrylate based super glue to help fuse the LVT/LVP point together. Be sure to clean all glue from the decorative surface immediately. Alcohol based super glues may cause the vinyl to swell.
10. Roll the plank/tile with a 3 section 100 lb. roller. Re-roll the entire glued floor area with the 100 lb. roller within the working time of the adhesive. Continue to roll the floor throughout the working day to ensure proper bond.

3.04 INSTALLATION OF ACCESSORIES

- A. Install accessories as required by drawings and per manufacturer's specifications.
- B. Provide transition strips between changes in flooring material.

3.05 CLEANING AND PROTECTION

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Recommended to use floor protection after installation. DO NOT use plastic adhesive-based protection system.

END OF SECTION 096519.23

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## SECTION 099123 - INTERIOR PAINTING

### PART 1 - GENERAL

#### 1.1 SECTION REQUIREMENTS

##### A. Submittals:

1. Product Data: Include printout of MPI's (Master Painter's Institute) "MPI Approved Products List" with product highlighted.
2. Provide paints with low-odor/low VOC meeting the requirements of LEED. All indoor paint shall be "Greenguard" certified. Refer to Specification Section 018113.

##### B. Mockups: Full-coat finish Sample of each type of coating, color, and substrate, applied where directed.

##### C. Extra Materials: Deliver to Owner 1 gal. (3.8 L) of each color and type of finish-coat paint used on Project, in containers, properly labeled and sealed.

### PART 2 - PRODUCTS

#### 2.1 PAINT

##### A. MPI Standards: Provide materials that comply with MPI standards indicated and listed in its "MPI Approved Products List."

1. Block Filler, Latex: MPI #4.
2. Primer Sealer, Latex: MPI #50.
3. Primer, Alkali Resistant, Water Based: MPI #3.
4. Primer Sealer, Institutional Low Odor/VOC: MPI #149.
5. Primer, Latex, for Interior Wood: MPI #39.
6. Primer Sealer, Alkyd, Interior: MPI #45.
7. Primer, Bonding, Water Based: MPI #17.
8. Primer, Bonding, Solvent Based: MPI #69.
9. Primer, Alkyd, Anticorrosive: MPI #79.
10. Primer, Galvanized, Water Based: MPI #134.
11. Primer, Quick Dry, for Aluminum: MPI #95.
12. Latex, Interior, Flat, (Gloss Level 1): MPI #53.
13. Latex, Interior, (Gloss Level 2): MPI #44.
14. Latex, Interior, (Gloss Level 4): MPI #43.
15. Latex, Interior, Semigloss, (Gloss Level 5): MPI #54.
16. Latex, Interior, Gloss, (Gloss Level 6, except Minimum Gloss of 65 Units at 60 Degrees): MPI #114.
17. Latex, Institutional Low Odor/VOC, Flat (Gloss Level 1): MPI #143.
18. Latex, Institutional Low Odor/VOC, (Gloss Level 2): MPI #144.
19. Latex, Institutional Low Odor/VOC, Semigloss (Gloss Level 5): MPI #147.
20. Latex, High-Performance Architectural, (Gloss Level 2): MPI #138.
21. Latex, High-Performance Architectural, Semigloss (Gloss Level 5): MPI #141.
22. Alkyd, Interior, Flat (Gloss Level 1): MPI #49.



23. Alkyd, Interior, Semigloss (Gloss Level 5): MPI #47.
24. Alkyd, Interior, Gloss (Gloss Level 6): MPI #48.
25. Alkyd, Quick Dry, Semigloss (Gloss Level 5): MPI #81.
26. Alkyd, Quick Dry, Gloss (Gloss Level 7): MPI #96.
27. Floor Paint, Latex, Low Gloss (Maximum Gloss Level 3): MPI #60.
28. Floor Enamel, Alkyd, Gloss (Gloss Level 6): MPI #27.

B. Material Compatibility: Provide materials that are compatible with one another and with substrates.

1. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. Colors: As selected from full line of colors unless scheduled.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Comply with recommendations in MPI's "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove hardware, lighting fixtures, and similar items that are not to be painted. Mask items that cannot be removed. Reinstall items in each area after painting is complete.
- C. Clean and prepare surfaces in an area before beginning painting in that area. Schedule painting so cleaning operations will not damage newly painted surfaces.

#### 3.2 APPLICATION

- A. Comply with recommendations in MPI's "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Paint exposed surfaces, new and existing, unless otherwise indicated.
  1. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces.
  2. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  3. Paint the back side of access panels.
  4. Color-code mechanical piping in accessible ceiling spaces.
  5. Do not paint prefinished items, items with an integral finish, operating parts, and labels unless otherwise indicated.
- C. Apply paints according to manufacturer's written instructions.
  1. Use brushes only where the use of other applicators is not practical.
  2. Use rollers for finish coat on interior walls and ceilings.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

1. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

### 3.3 INTERIOR PAINT APPLICATION SCHEDULE

- A. Concrete, Nontraffic Surfaces:
  1. Gloss Level 3 (eggshell) Latex: Two coats over primer/sealer: MPI INT 3.1A.
- B. Concrete, Traffic Surfaces:
  1. Low-Gloss Latex Floor Paint: Two coats: MPI INT 3.2A.
- C. Clay Masonry:
  1. Gloss Level 3 (eggshell) Latex: Three coats: MPI INT 4.1A.
- D. Concrete Masonry Units:
  1. Gloss Level 3 (eggshell) Latex: Two coats over latex block filler: MPI INT 4.2A.
- E. Steel:
  1. Gloss Level 3 (eggshell), Quick-Dry Enamel: Two coats over quick-drying alkyd metal primer: MPI INT 5.1A.
- F. Galvanized Metal:
  1. Semigloss Latex: Two coats over waterborne galvanized-metal primer: MPI INT 5.3J.
- G. Aluminum:
  1. Semigloss Latex: Two coats over quick-drying primer for aluminum: MPI INT 5.4H.
- H. Wood Painted: Where indicated; Including wood trim, doors, glued-laminated construction, exposed joists and beams.
  1. Semigloss, or as scheduled Latex: Two coats over latex primer for wood: MPI INT 6.3T.
- I. Wood Stained: Where indicated for doors.
  1. Stained wood (color selected by Architect). Two coats clear polyurethane: MPI INT 186 and 128.
- J. Fiberglass and Plastic:
  1. Semigloss Latex: One coat over water-based bonding primer: MPI INT 6.7A.
- K. Gypsum Board and Plaster:
  1. Gloss Level 4 (satin), or as scheduled Latex: Two coats over latex primer/sealer: MPI INT 9.2A.
- L. Spray-Textured Ceilings:

1. Flat Latex: One coat over primer/sealer: MPI INT 9.1A

END OF SECTION 099123

## SECTION 102800 - TOILET AND MISCELLANEOUS ACCESSORIES

### 1.1 GENERAL

- A. Submittals: Manufacturer's Product Data. Include construction details, material descriptions and thicknesses, dimensions, profiles, fastening and mounting methods, specified options, and finishes for each type of accessory specified.
- C. Product Options: Accessory requirements, including those for materials, finishes, dimensions, capacities, and performance, are established by specific products indicated.
  - 1. Other manufacturers' products with equal characteristics may be considered. See Division 1 Section "Substitutions."

### 1.2 PRODUCTS

- A. Manufacturers: Subject to compliance with requirements, provide accessories by one of the following:
  - 1. American Specialties, Inc.
  - 2. Bradley, Inc.
  - 3. Bobrick
- B. Materials - General: As follows:
  - 1. Stainless Steel: ASTM A 666, Type 304, with No. 4 finish (satin), in 0.0312-inch minimum nominal thickness, unless otherwise indicated.
  - 2. Sheet Steel: ASTM A 366/A 366M, cold rolled, commercial quality, 0.0359-inch minimum nominal thickness; surface preparation and metal pretreatment as required for applied finish.
  - 3. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service), nickel plus chromium electrodeposited on base metal.
  - 4. Baked-Enamel Finish: Factory-applied, gloss-white, baked-acrylic-enamel coating.
  - 5. Mirror Glass: ASTM C 1036, Type I, Class 1, Quality q2, nominal 6.0 mm thick, with silvering, electroplated copper coating, and protective organic coating complying with FS DD-M-411.
  - 6. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
  - 7. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.
- C. Single-Roll Toilet Tissue Dispenser: Size to accommodate core type tissue to 5-inch-diameter roll. Stainless steel. ASI 7314
- D. Towel Ring: 7" Diameter ring, Stainless Steel. ASI 7306
- E. Robe Hook: Double hook, Stainless Steel. ASI 7312
- F. H.C. Shower Curtain Rod, Heavy-Duty: 1-¼ inches o.d., 18-gauge) stainless steel, satin finish; furnish with 3 inches o.d., minimum 0.04-inch (20-gage) stainless steel flanges with satin finish, designed for exposed fasteners. Rod - ASI 1204 (length as required), Flanges – 1204-1
- G. Shower Curtain: Vinyl 10ga. translucent white shower curtain with metal curtain hanger rings. Curtain: ASI 1200-V72 with 12 roller hooks: ASI 1200-ROL
- H. Mirror: Surface Mounted. ¾" x 5/8" 18 gauge stainless steel frame with heliarc welded corners. Concealed fasteners. Mirror to be minimum 18" wide x 30" tall. ASI-0600-1830

- I. Medicine Cabinet: Surface-Mounted, 26 GA. Stainless Steel, 17"x30"x4", Basis of design: Bradley 175-11
- J. Fold-Up Shower Seat: Fold-up stainless steel shower seat with solid phenolic ivory-white seat slats. Basis of Design ASI #8206-L.
- K. Exhaust Fan/ Light: See mechanical Drawings or Specifications.
- L. Grab Bars: 18-ga. 304 satin finish stainless steel grab bars with type 304 stainless steel 14 ga. flanges and 20 ga. cover plates, satin finish, complying with ANSI and H.C. accessibility standards. Size and configuration per drawings.
- M. H.C. Undersink Pipe Insulation: Polyethelyne with ABS Jacket. Truebro or equal.
- N. Tub/ Shower Walls: 3-piece 72" tall solid surface reinforced acrylic filled with natural minerals compression molded with uniform thickness and color molded throughout, min. ¼" thick shower wall panel system. Basis of design; Swanstone model SMMK723662 with two (2) SS-7211 corner soap dish (mount one each corner top at 48" above floor), or Custom Cast Works solid surface surround. Install in strict accordance with mfg. instructions.

### 1.3 EXECUTION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated. All accessories shall be secured to wood, masonry surfaces, or structural members.
- B. Install tub/shower walls per manufacutrer's written instructions. Provide cementious backer behind all shower surrounds.
- C. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items.
- D. Remove temporary labels and protective coatings.
- E. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

## SECTION 10 73 46 – PRE-FABRICATED SITE SHELTERS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Design, fabrication, finishing, and delivery of pre-engineered, factory-fabricated site shelters.
- B. Site work related to installation, by Contractor, including:
  - 1. Unloading and temporary storage, if any.
  - 2. Soil testing.
  - 3. Site preparation.
  - 4. Column foundations, rebar, anchor bolts, and anchor embedment.
  - 5. Concrete slab and embedment.
  - 6. Erection.
  - 7. Field touch up painting of factory finishes, if necessary.
- C. Site access for delivery vehicles to be provided by Contractor.
- D. Related Sections: Section 033000 - Cast-In-Place Concrete: Concrete footings and slabs.

#### 1.2 SYSTEM DESCRIPTION

- A. Design shall meet or exceed applicable building code.
- B. Pre-fabricated package shall include structural steel framing members, pre-cut roof panels, trim, and fasteners.
- C. All bolts shall be hidden, concealed inside the steel tubes.
- D. Field labor required to install the pre-fabricated parts. Onsite welding shall not be required or permitted.

#### 1.3 REFERENCES

- A. American Society of Testing Material (ASTM)
  - 1. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated
  - 2. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
  - 3. ASTM A563 - Standard Specification for Carbons and Alloy Steel Nuts
  - 4. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
  - 5. ASTM F1554 – Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
- B. American Institute of Steel Construction (AISC)

- C. American Welding Society (AWS)
- D. Steel Structures Painting Council (SSPC); SSPC-SP10 - Near-White Blast Cleaning
- E. Leadership in Energy and Environmental Design (LEED)
- F. OSHA Standards 29 CFR, Part 1926, Subpart R (Steel Erection), Standard Number 1926.755: Compliance requires a minimum of four anchor bolts per column.

#### 1.4 QUALITY ASSURANCE

- A. Designer Qualifications: Design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State where the Project is located.
- B. Manufacturer Qualifications: Company experienced in design and manufacture of shelters of the type specified, and having the following:
  - 1. Minimum five years of experience in design and fabrication of pre-fabricated steel shelters.
  - 2. Three references of similar shelters completed within the past year.
  - 3. Fabricator membership in American Institute of Steel Construction (AISC), requiring quality control documentation and procedures. Provide current AISC shop certification upon request.
  - 4. All welding to be performed to AWS standards by AWS certified welders. Provide welding certification upon request.
- C. Perform the work in accordance with applicable federal, State, and local building and safety codes and regulations.

#### 1.5 SUBMITTALS

- A. Minimum 1 electronic set of shop drawings, showing all details of construction, including foundation sizes, reinforcement, and locations.
  - 1. Provide the licensed professional engineer's state stamp or seal on the shop drawings.
  - 2. Provide the licensed professional engineer's state stamp or seal on the structural calculations.
- B. Selection Samples: For each finish product specified, color charts representing manufacturer's full range of available colors.
- C. Warranty
  - 1. Provide minimum five-year frame warranty against manufacturer defects.
  - 2. Provide roofing manufacturer's limited warranty.

#### 1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Package factory-finished steel components in foam, cardboard, and stretch wrap to protect the finish during transit.
- B. Shipped knocked down for minimal shipping charges.
- C. Deliver products to project site in manufacturer's protective packaging.
- D. Follow shelter manufacturer's recommendations and instructions, including those printed on the shop drawings. To minimize damage during unloading, use only padded forks or non-marring slings.
- E. Store products in manufacturer's unopened packaging well off the ground and covered out of weather until ready for installation.

## PART 2 PRODUCTS

### 2.1 GENERAL

- A. Model: TS-\_\_\_\_\_as manufactured by RCP Shelters, Inc.
- B. Size and dimensions
  - 1. Shape: Rectangular
  - 2. Dimensions: 24'x30'
  - 3. Roof Style: Gable
  - 4. Roof Pitch: 4:12
  - 5. Eave Height: minimum 7'-6"
  - 6. Provide Option: Electrical access throughout steel frame
  - 7. Provide Option: Gutters and downspouts.
- C. Approved Manufacturer: RCP Shelters, Inc.
  - 1. 2100 SE Rays Way, Stuart, FL 34994.
  - 2. Toll Free: 800-525-0207
  - 3. Fax: 772-288-0207
  - 4. Website: [www.rcpshelters.com](http://www.rcpshelters.com)
  - 5. Email: [info@rcpshelters.com](mailto:info@rcpshelters.com)
- D. Substitutions: Equal products may be submitted for review

### 2.2 STEEL STRUCTURAL COMPONENTS

- A. Structural Framing: fabricated for field assembly using bolted connections with no welding required or permitted; cold-formed shapes prohibited.
  - 1. Columns & Beams: ASTM A500 Grade C structural steel tube. The following shapes are prohibited: I-beams, wide-flange beams, C-channels, Z-shapes.
  - 2. Plates: ASTM A572 Grade 50.
  - 3. Compression Ring: steel plate, ASTM A572 Grade 50.
  - 4. Fasteners



- a. Bolts: ASTM A325 high strength bolts.
    - b. Nuts: ASTM A563 high strength nuts.
  5. Column Anchors: ASTM F1554 Grade 36, provided by Contractor or Owner, attached to top of foundation, recessed below slab on grade.
  6. Cap plates: factory bent and field installed with hidden fasteners on hip and ridge beams not normal to roof so that metal roof deck does not bear structurally on beam corner only
  7. Finish: Powder Coat
    - a. Pre-blast inspection to catch and remove oil, grease, and other coatings impeding contaminants
    - b. Steel grit blasted to near white condition in accordance with SSPC-SP10, removing all oil residue, mil scale, weld spatter, and slag
    - c. Five stage phosphate wash (includes detergent, phosphate, rust protectant sealant)
    - d. Epoxy powder coat primer
    - e. Topcoat of TGIC polyester powder coat; color to be selected from manufacturer's standard color chart by Owner.
    - f. All materials inspected to meet 100% coating, proper cure, film thickness, and impact resistance
    - g. Wet-coat alternatives shall not be acceptable.
- B. Roof System: Galvalume® structural metal roof panels with exposed fasteners.
1. Acceptable Panel Profiles:
    - a. Galvalume® panels with 1-3/16" high ribs, 12" on center.
    - b. Galvalume® panels with 1-1/2" high ribs, 7.2" on center.
  2. Panel Gauge: minimum 24-gauge.
  3. Panel Width: 3'-0".
  4. Panel Length: Precut to the length from the eave to the ridge; angles factory precut.
  5. Panel Orientation: Ribs shall run with the pitch of the roof for proper drainage.
  6. Trim: Provide matching roof trim and fasteners.
  7. Finish: Factory pre-finished with Kynar 500® paint system; color to be selected by Owner from standard color chart.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify that site earthwork has been performed as required for satisfactory installation.

#### 3.2 PREPARATION

- A. Install footings and column anchors of size, design, and location as specified by shelter manufacturer on approved shop drawings.

#### 3.3 INSTALLATION

- A. Perform installation in accordance with applicable federal, State, and local building and safety codes.

- B. Structural special inspections, if required, are to be arranged and paid for by the Contractor or Owner.
- C. Install shelter in accordance with manufacturer's approved shop drawing and good construction practices.
- D. Install slab in accordance with shelter manufacturer's shop drawings. Slab perimeter dimensions determined by Owner.
- E. Electrician to provide conduit and wiring for receptacle and lighting

#### 3.4 CLEANING AND PROTECTION

- A. Clean installed work to like-new condition.
- B. Protect installed products until completion of project.
- C. Touch-up, repair, or replace damaged finishes before Substantial Completion. Touch up paint provided by manufacturer.

END OF SECTION

## SECTION 113100 - RESIDENTIAL APPLIANCES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Cooking appliance (range)
  - 2. Rangehood
  - 3. Refrigerators
  - 4. Washer
  - 5. Dryer

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each exposed finish.
- C. Maintenance data.

#### 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.
- B. 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.
- C. Residential Appliances: Comply with NAECA standards.

#### 1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer of each appliance specified agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
  - 1. Electric Range: Five-year limited warranty for surface-burner elements.
  - 2. Refrigerator: One-year limited warranty.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- 1. Acceptable manufacturers:
  - a. General Electric
  - b. LG
  - c. Whirlpool
  - d. Frigidaire
  - e. Amana

#### 2.2 COOKING APPLIANCES

- A. Electric Range Accessible Units:

1. Type: Freestanding, 30" electric, front controls, coil burners.
2. Maximum Dimensions: 30-1/2" wide x 30" deep x 36" to top of cooking surface.
3. Color: White or Black
4. Basis of Design: Whirlpool WEC310S0LW (White) or WEC310S0LB (Black). Provide back-splash kit per CASEWORK 123530

B. Refrigerator:

1. Type: Frost-free, Energy Star rated 18.3 Cu. Ft. Recessed Handle, Top-Freezer, ADA approved.
2. Maximum Dimensions: 30" wide x 31" deep x 66" high.
3. Color: White or Black
4. Basis of Design: Frigidaire FFHT1835VW (White) FFHT1835VB (Black)

C. Washing Machine:

1. Type: Front load, 5.0 CF, Energy Star rated, ADA approved.
2. Maximum Dimensions: 27" wide x 30" deep x 39" high.
3. Motor Type: Inverter Direct Drive
4. Wash Programs: 8
5. Color: White
6. Supply hoses: Braided stainless steel
7. Basis of Design: LG WM3400W

D. Clothes Dryer:

1. Type: Front load, 7.4 CF, Energy Star rated, ADA approved.
2. Maximum Dimensions: 27" wide x 30" deep x 39" high.
3. Dry Programs: 8
4. Color: White
5. Basis of Design: LG DLE 3400W

2.3 ACCESSORIES

A. Exhaust Hood:

1. Type: Low sone, 30-inch, under-cabinet hood with 6" ducted-vent operation with washable filter.
2. Exhaust Fan: Two-speed fan. 100CFM min.
3. Light: Lighted range hood
4. Finish: Baked enamel
5. Color: Match appliances

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- B. Provide all required power cords, wiring, gas piping, valves, hoses, duct, etc. required for a complete installation.
- C. Install equipment in accordance with manufacturer's printed instructions, including the installation of anti-tip devices, installation of electrical connections, and removal of all packing materials.
- D. Utilities: Refer to MEP drawings for plumbing and electrical requirements.

END OF SECTION 113100

## SECTION 123530 - KITCHEN CASEWORK

### 1.1 GENERAL

- A. Summary: Provide kitchen framing and countertops where indicated.
- B. Submittals: In addition to product data for each casework and hardware type indicated, submit the following:
  - 1. Shop drawings for casework showing location and size, accessories, materials, finishes, filler panels, and anchorage details.
  - 2. Samples: Submit one sample drawer front or equal showing color and finish.
- C. Casework: Comply with ANSI/KCMA A161.1.
  - 1. KCMA Certification: Provide kitchen casework with Kitchen Cabinet Manufacturers Association (KCMA) "Certified Cabinet" seal affixed in a semiexposed location of each unit, showing compliance with above standard.
  - 2. HUD Certification: Provide kitchen and bath casework with the HUD approved seal affixed in a semiexposed location of each unit. showing compliance with the above standards and classification as a HUD Severe Use grade.
- D. Field Measurements: Verify casework dimensions by field measurements. Verify casework can be installed in compliance with the original design and referenced standards.

### 2.0 PRODUCTS

#### 2.1 CABINETRY

- A. Basis of design: Wolf Home Products, Wolf "Classic" Insight Series, Dartmouth face style. Cabinetry from other manufacturers will be considered subject to compliance with this Section and the below specifications:
  - 1. ½" thick dovetail hardwood drawers with side mounted drawer guides.
  - 2. 12mm dovetail drawers
  - 3. 6-way adjustable hidden hinges.
  - 4. Nominal 5/8" thick adjustable wall and base hardwood plywood shelving.
  - 5. ¾" thick hardwood frames.
  - 6. Nominal ½" thick plywood end panels with natural birch veneer interior and exterior.
  - 7. Pull-out shelf trays in bottom of base cabinet storage areas (except sink bases).
  - 8. Factory finish – Owner selected from all available options.

- B. Door and Drawer Fronts: Wood stiles and rails, with flat wood center panels.
- C. Door and Drawer Fronts: Solid wood.
- D. Face Frame Finish: Wood.
- E. Exposed Cabinet End Finish: Wood.
- F. Exposed Wood: Manufacturer's standard domestic hardwood species clear solid wood or hardwood plywood with Grade A faces according to HPVA HP-1, selected for compatible color and grain.
- G. Door and Drawer Pulls: 4" brushed nickel Wire pulls, ANSI A156.9.
- H. Hinges: Concealed European-style self-closing hinges.
- I. Drawer Guides: Epoxy-coated-metal, self-closing drawer guides with nylon-tired, ball-bearing rollers.
- J. Pull-out Shelves: All base cabinet storage shall incorporate a pull-out shelf tray except for sink base cabinets.
- K. Filler and Trim: Solid wood finished to match cabinets.
- L. Finish: Factory finish to be selected from manufacturer's standard stained wood finishes.
- M. H.C. Accessible Units: Note cabinet requirements for accessible units. See drawings.

## 2.2 COUNTERTOP MATERIALS

- 1. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.
  - a. Grade: HGP.
  - b. Colors, Textures, and Patterns: As selected by Owner from plastic-laminate manufacturer's full range.
- 2. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
  - a. Configuration: Provide countertops with the following front, cove (intersection of top with backsplash), backsplash, and endsplash style:
    - 1. Front: Rolled.
    - 2. Cove: Cove molding (one-piece postformed laminate supported at junction of top and backsplash by wood cove molding).
    - 3. Backsplash: Curved or waterfall shape.
    - 4. Endsplash: Square edge.

### 1.3 EXECUTION

- A. Provide and install casework and countertops where indicated with no variations in flushness of adjoining surfaces using concealed shims. Secure cabinets to wall framing with screws. Where casework abuts other finished work, scribe and cut for accurate fit. Caulk entire perimeter of cabinet with clear silicone per Section 079200 prior to installing trim. Provide filler strips, scribe strips, and moldings in finish to match casework face.
- B. Install casework level and plumb to a tolerance of 1/8 inch in 8 feet. If shims are required between base cabinets and floor, trim bottom of cabinets to achieve a maximum base cabinet height of 32.5" above finished floor.
- C. Fasten unit of casework to adjacent unit and into structural support members of wall construction with #10 sheet metal or wood screws with wafer-head or washer. Drill pilot holes and take other precautions when mounting to prevent damage to the cabinetry. Split frames or other damage will not be accepted and damaged cabinets will be rejected. Each wall cabinet shall have a minimum of four (4) fasteners (2 high and 2 low). Base cabinets shall be secured with a minimum of two (2) fasteners. Provide and install fillers for a complete installation.
- D. Plastic laminate countertops to be installed in conjunction with new cabinets. Scribe countertops for proper fit to wall. Secure countertop to base with screws.
- E. Clean and adjust all cabinetry upon completion.

END OF SECTION 123530

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## SECTION 323180 – WOOD AND VINYL FENCES AND GATES

### PART 1 - GENERAL

- A. This Section includes free-standing vinyl fencing.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of structure/product indicated.
- B. Shop Drawings: For each structure/product indicated.

#### 1.3 QUALITY ASSURANCE

- A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. System: Deliver, store, and handle fencing system according to requirements in manufacturer's Specifications.

### PART 2 - PRODUCTS

- A. Vinyl Fence: Provide 6' tall (Unit Patio Privacy) and 8' tall (Dumpster Enclosure), The Augusta™, as manufactured by USA Vinyl Fence Company – Groveport, OH [www.weatherables.com](http://www.weatherables.com) or approved equal. Color shall be white for all vinyl components. Provide all required rails, stiffeners, reinforcing, pickets, posts, caps, and fasteners required to provide a complete installation. Fencing shall meet or exceed the following:
- B. Posts: Square posts 5"x5". Length 140" min for 8' tall fencing and 108" min. for 6' tall fence. Thickness 0.150" min.
- C. Panels: 6' tall panels with three horizontal rails. Horizontal rails shall be 1.5" x5.5" and have a material thickness of 0.090". Horizontal Rails shall have aluminum inserts to stiffen the panels. Vertical pickets shall be tongue and groove 0.875"x6" min. Material thickness shall be 0.065" min.
- D. Caps: "External Cap" manufactured to fit fencing system posts.
- E. Vinyl fencing components shall meet or exceed the requirements below:
  - 1. Impact Load – ASTM D256: 22.5ft.lbs/in
  - 2. Tensile Yield Strength – ASTM D638: 6606 psi
  - 3. Tensile Modulus – ASTM D638: 432,000 psi
  - 4. Flexural Modulus – ASTM D-790: 378,000 psi
  - 5. Cell Classification – ASTM D1784-14344B: 1,333
- F. Provide a minimum 30-year non-prorated warranty.

## EXECUTION

### 3.1 PREPARATION & INSTALLATION

- A. Prepare the area to receive the new fencing-remove all existing fence components. Follow the manufacturer's printed instructions when preparing and placing the new structure.
  - 1. Columns: Set the new columns in depths as indicated by the manufacturer, but no less than 36" deep. Set columns at minimum distances as recommended by the manufacturer. Set posts for dumpster fencing in 12" diameter hole and fill with concrete.
  - 2. Panels: Secure the new panel system with clips and rings as required by the manufacturer. Set panels in minimum increments as recommended by the manufacturer.
  - 3. Install all components in strict accordance with manufacturers written instructions.

END OF SECTION 323180