

PROJECT MANUAL FOR:

A NEW DEVELOPMENT FOR:  
**WESTWOOD AT  
WINTERHAVEN**

AVENUE G N.W.  
WINTER HAVEN, FL 37764  
HUD #067-35554

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COMM. NO. 180888  
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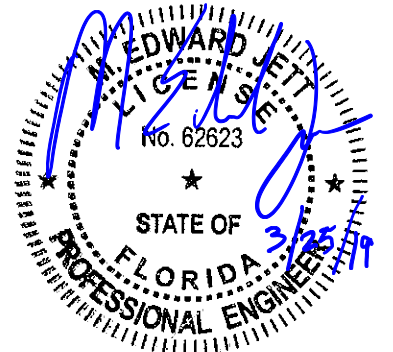
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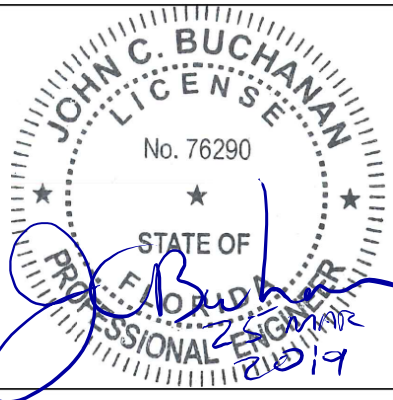
ARCHITECTURE



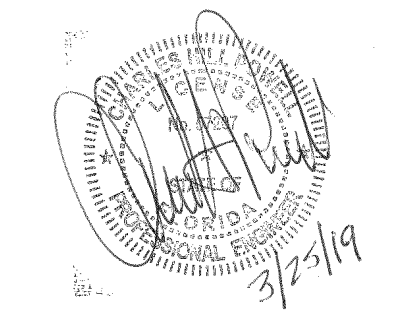
STRUCTURAL



MECHANICAL



ELECTRICAL



CIVIL

**A New Development for:**  
**Westwood at Winterhaven Apartments**  
**Avenue "G" N.W., Winter Haven, FL 33881**  
**HUD #067-35554**

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N/A

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End of Section



# AIA<sup>®</sup> Document A701<sup>™</sup> – 1997

## ***Instructions to Bidders***

for the following PROJECT:

*(Name and location or address)*

**THE OWNER:**

*(Name, legal status and address)*

**THE ARCHITECT:**

*(Name, legal status and address)*

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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. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

## 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 other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

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

§ 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 as the base, to which Work may be added or from which Work may be deleted for 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 the amount of 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 The Bidder by making a Bid represents that:

§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

§ 2.1.2 The Bid is made in compliance with the Bidding Documents.

§ 2.1.3 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 personal observations with the requirements of the proposed Contract Documents.

§ 2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

## ARTICLE 3 BIDDING DOCUMENTS

### § 3.1 COPIES

§ 3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded.

§ 3.1.2 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.

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

§ 3.1.4 The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

## § 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

§ 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.

§ 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

§ 3.2.3 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will 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 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. 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.

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

§ 3.3.4 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 all who are known by the issuing office to have received a complete set of Bidding Documents.

§ 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

§ 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 Each Bidder shall ascertain prior to submitting a Bid 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 the Bidding Documents.

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

§ 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

§ 4.1.4 Interlineations, alterations and erasures 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."

§ 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 make no 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 of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give 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.

## § 4.2 BID SECURITY

§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instructions to Bidders. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, 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. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

§ 4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

## § 4.3 SUBMISSION OF BIDS

§ 4.3.1 All copies of the Bid, the bid security, if any, 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.

§ 4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

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

§ 4.3.4 Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

## § 4.4 MODIFICATION OR WITHDRAWAL OF BID

§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

§ 4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the



signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

§ 4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

§ 4.4.4 Bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

## **ARTICLE 5 CONSIDERATION OF BIDS**

### **§ 5.1 OPENING OF BIDS**

At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

### **§ 5.2 REJECTION OF BIDS**

The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

### **§ 5.3 ACCEPTANCE OF BID (AWARD)**

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. 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 own best interests.

§ 5.3.2 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 low 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, a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

### **§ 6.2 OWNER'S FINANCIAL CAPABILITY**

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

### **§ 6.3 SUBMITTALS**

§ 6.3.1 The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Owner through the Architect in writing:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; 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 in writing 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, (1)



withdraw the Bid or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover 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. Bonds may be secured through the Bidder's usual sources.

§ 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 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

### **§ 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 be commenced prior thereto 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. Both bonds shall be written in the amount of the Contract Sum.

§ 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 thereto a certified and current copy of the power of attorney.

## **ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR**

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.

# **Additions and Deletions Report for**

## **AIA<sup>®</sup> Document A701<sup>™</sup> – 1997**

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 14:28:12 on 08/30/2012.

### **PAGE 1**

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## SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

### PART I GENERAL:

#### 1.01 GENERAL:

- A. The following amendments modify, change, delete from or add to the Instructions to Bidders (AIA Document A701, 1997 Edition). Where any part of the Instructions to Bidders is modified or voided by these amendments, the unaltered provisions of that part shall remain in effect.

#### 1.02 BID SECURITY:

Bid security shall be in the form of a bid bond secured by a Surety Company or a Cashiers Check, and shall be in the amount of not less than five percent (5%) of the amount of the bid.

#### 1.03 SUBMISSION OF BIDS:

In addition to the information listed in Subparagraph 4.3.1, the sealed envelope containing the bid shall be plainly marked on the outside with the bidding contractor's license number, date of expiration of the license, license limitation, and that part of license classification applying to the bid. If this information is not marked on the outside of the envelope, the Architect and the Owner are prohibited from opening and considering the bid by the requirements of The contractor's Licensing Act of 1976 enacted by the General Assembly of the State of Tennessee, as amended by Chapter 9 and Chapter 406 of the Public Acts of 1977. The names of the Mechanical and Electrical Subcontractors, License numbers and date of expiration of their licenses must be on the bid envelopes.

Notes: Bidders' attention is called to the provisions of the Contractor's Licensing Act that particular subcontractors (Electrical, Mechanical, HVAC, Masonry, Geothermal, etc.) must have a contractor's license if the aggregate amount of their subcontract is equal to or exceeds monetary limits enumerated in that Act for each subcontractor's trade.

#### 1.04 CONTRACT FOR CONSTRUCTION:

The Contract for Construction of the Project will be executed on AIA Document A101, 2017 version.

#### 1.05 PERFORMANCE AND LABOR AND MATERIALS PAYMENT BOND:

The successful bidder will be required to furnish a Performance Bond and a Labor and Materials Payment Bond in the amount of one hundred percent (100%) of the contract sum. Bonds shall be executed on AIA Document A311.

#### 1.06 DEFINITIONS:

- A All definitions set forth in the General Conditions of the Contract for Construction, AIA Document A-201 - 2017 Edition, are applicable to these Instructions to Bidders.
- B Bidding documents include the Invitation to Bid, Instructions to Bidders, the Bid Forms, Agreement between Owner and Contractor and the proposed Contract Documents including any Addenda issued prior to receipt of Bids.
- C Addenda are written or graphic instruments issued prior to the execution of the Contract which modify or interpret the bidding documents, including Drawings and Specifications, by additions, deletions, clarifications or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.

- D All correspondence concerning the bid process shall be addressed to the Architect.
- E A Bid is a complete and properly signed proposal to do the Work or designated portion thereof for the sums stipulated therein, submitted in accordance with the Bidding Documents.
- F The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which work may be added or from which work may be deleted for sums stated in any Alternate Bids.
- G A Bidder is a person or entity who submits a Bid.
- H A Sub-Bidder is a person or entity who submits a bid to a Bidder for materials or labor for a portion of the Work.

1.07 EXAMINATION OF DOCUMENTS AND SITE:

- A. Each Bidder, by making his Bid, represents that he has read and understands the Bidding Documents.
- B. Each Bidder, by making his Bid, represents that he has visited the site and familiarized himself with the local conditions under which the Work is to be performed.
- C. Each Bidder, by making his Bid, represents that his Bid is based upon the materials, systems and equipment required by the Bidding Documents unless exceptions are noted on the Bid Form.

1.08 BIDDING PROCEDURES:

- A. All Bids shall be prepared on the forms provided by the Owner and submitted in accordance with the Instructions to Bidders. The Owner will furnish Bidders with Bid Forms which will provide for the following Bid Items:
  - 1. A single contract price for the Work as detailed and described in these Instructions.
  - 2. Acknowledgment of Addenda.
  - 3. Number of calendar days to complete project.
  - 4. Subcontractors required to be listed by state law (See 1.03 above).
- B. A Bid is invalid if it has not been received at the designated location prior to the time and date for receipt of bids indicated in the Invitation to Bid, or prior to any extension thereof issued to the Bidders.
- C. Unless otherwise provided in any supplement to these Instructions to Bidders, no bidder shall modify, withdraw or cancel his Bid or any part thereof for forty-five (45) after the time designated for the receipt of Bids in the Invitation to Bid.
- D. Prior to the receipt of Bids, Addenda will be mailed or delivered to each person or firm recorded by the Architect and Engineer as having received the Bidding Documents. Addenda issued after receipt of Bids will be mailed or delivered only to the selected Bidder.
- E. Bids shall not contain any recapitulation of the Work (except as noted on the Bid Form) to be done and no oral or telephone proposals or modifications will be considered.

- F. The Bidder shall make no additional stipulations on the Bid Form or limit or qualify his Bid in any other manner. Bids so qualified will be subject to disqualification.
- G. Only written instructions will be binding. The Architect or Engineer will not be responsible for any oral, telegraphic or telephonic instructions.
- H. The names of all Subcontractors and material suppliers proposed to be employed shall be submitted for approval by the Owner before they are employed, and all such Subcontractors and material suppliers must be known to perform work of a high standard in their respective trades. If the Owner has reasonable objection to any such proposed person or entity, and notifies the Bidder in writing of such objection, the Bidder shall provide an acceptable substitute person or entity in accordance with Article 5.2 of the General Conditions.

1.09 DISCREPANCIES AND AMBIGUITIES:

- A. Each Bidder shall examine the Bidding Documents carefully and, not later than ten (10) days prior to the date for receipt of Bids, shall make written request to the Architect or Engineer via email only, for interpretations or correction of any ambiguity, inconsistency or error therein which he may discover. The Architect or Engineer will issue any interpretation or correction as an Addendum. Only a written interpretation or correction by Addendum shall be binding. No Bidder shall rely upon any interpretation or correction given by any other method.

1.10 SUBSTITUTIONS:

- A. Each Bidder represents that his Bid is based upon the materials and equipment described in the Bidding Documents.
- B. Where products or systems are specified by naming only one manufacturer and no provisions for substitutions are listed, no substitutions are allowed. Where substitution provisions are listed, they will only be considered if approved by Addenda prior to Bidding.

1.11 QUALIFICATION OF BIDDERS:

- A. If required, a Bidder shall submit to the Owner a properly executed Contractor's Qualification Statement, AIA Document A-305 and/or properly documented experience record.
- B. Bidders may be disqualified and their Bids not considered for any of the following specific reasons:
  - 1. Reason for believing collusion exists among Bidders.
  - 2. The Bidder being interested in any litigation against the Owner.
  - 3. The Bidder being in arrears on any existing contract or having defaulted on a previous contract.
  - 4. Lack of competency as revealed by the financial statement, experience and equipment, questionnaires, or qualification statement.
  - 5. Uncompleted work which in the judgment of the Owner will prevent or hinder the prompt completion of additional work if awarded.
- C. If required, a Bidder shall submit to the Owner a confidential Financial Statement in a sealed envelope.

End of Section

## SECTION 00 31 32 - SUBSURFACE INVESTIGATION

### PART I GENERAL:

#### 1.01 GENERAL

- A. The following Report of Subsurface Investigation is made available by the Owner to Bidders for information only. The Owner will not be responsible for the accuracy of such report. The Owner will not be responsible for interpretation or conclusions drawn by the Contractor from such report.

“Report of Geotechnical Exploration: Westwood at Winterhaven

Avenue G

Winter Haven, FL. 33380

Professional Services Inc. (PSI)

PSI project # 07572421

### PART II PRODUCTS:

NOT USED

### PART III EXECUTION:

NOT USED

End of Section



**Report**  
**Geotechnical Engineering Services**  
**Westwood Apartments**  
**Inwood, Florida 33880**  
**PSI Project No. 07572421**



Project Number: 07572421  
April 16, 2020

Professional Service Industries, Inc.  
1748 33<sup>rd</sup> Street, Orlando, FL 32839  
Phone: (407) 304-5560  
Fax: (407) 304-5561

Mr. Timothy Barton  
**AVEG WW, LLC**  
13901 Midway Road  
Suite 102  
Dallas, Texas 75244

RE: Report  
Geotechnical Engineering Services  
Westwood Apartments  
Inwood, Florida 33880

Dear Mr. Barton:

In general accordance with PSI Proposal No. 0757-304715 dated March 5, 2020 and your authorization, **Professional Service Industries, Inc. (PSI), an Intertek Company**, has completed a geotechnical evaluation at the site of the referenced project. The subsurface exploration was conducted to provide geotechnical engineering recommendations to guide design and construction of the proposed multi-family apartment buildings and the associated civil infrastructure at the project site.

#### PROJECT INFORMATION

The project site is an undeveloped parcel of land bordered by Avenue J Northwest to the north, Westwood Middle School and the Polk County Sheriff Central Substation to the east, Avenue G Northwest to the south and an existing warehouse building to the west. Based on our observations of the site during the field exploration program, the property is vacant, and grass covered with a sporadic distribution of trees and brush. The western portion of the site contains a wet-bottom stormwater pond. The western portion of the site containing the stormwater pond and the vacant area to the north of the pond is not a part of the proposed development.

Based on the development plan and information provided to PSI, the site is a single parcel of land with Parcel ID 252824-353603-000020 with a total approximate plan area of 21.68± acres.

Future development plans for the project include the construction of 17 multi-family apartment buildings, each 2 to 3 stories tall. In addition to the apartments, a single-story leasing office, swimming pool, paved parking and drive areas are planned for the project. We assume stormwater for the site will be handled by the existing stormwater system located in the western portion of the property.

Foundation loads for the proposed buildings were not made available to PSI at the time of preparing this proposal. However, based on our past experience with similar projects, we anticipate the new apartment buildings will be constructed using light, wood frame structures supported on conventional shallow foundations or post tensioned slabs. We anticipate the maximum column and wall foundation loads for the apartment buildings will be less than 200 kips and 5 kips per lineal foot, respectively. Similarly, we anticipate the maximum wall and foundation loads for the single-story leasing office building to be 75 kips and 3 kips per lineal foot, respectively.







The noted information/assumptions have been used for the purpose of preparing this report. If any of the stated information/assumptions are incorrect or have been changed, PSI should be notified so appropriate changes to our recommendations can be incorporated in this report.

## **REVIEW OF PUBLISHED DATA**

### **USGS Topographic Map**

The topographic survey map published by the USGS entitled “Auburndale, Florida” was reviewed for ground surface features in the area of the proposed development. Based on this review, the natural ground surface elevation is on the order of +150 feet National Geodetic Vertical Datum (NGVD) of 1929. The site-specific topographic survey information provided to PSI indicates the ground surface elevations to be varying from approximately +151 to +154 feet North American Vertical Datum (NAVD) of 1983, adjustment of 1990. The provided survey information is relatively consistent with the published information.

**Figure 1** of the **Appendix** contains an excerpt of the USGS topographic map.

### **SCS Soil Survey**

The “Soil Survey of Polk County, Florida,” published by the USDA SCS, was reviewed for general near-surface soil information within the general project vicinity. This information indicates that there are three soil groups within the vicinity of the proposed project. The general information provided by the SCS for the mapped soil units are summarized in the following table.

Soil Series	Depth (inches)	Unified Classification	USDA Seasonal High Groundwater Table
			Depth (feet)
14 – Sparr sand, 0 to 5 percent slopes	0 to 80	SP-SM, SM, SM-SC, SC	1.5 to 3.5
22 – Pomello fine sand	0 to 80	SP, SP-SM, SM	2 to 3.5
53 – Myakka-Immokolee-Urban land complex	0 to 80	SP, SP-SM, SM	0 to 1

**Figure 2** of the **Appendix** contains an excerpt of the USDA soil mapping information for the project site.



## **FIELD EXPLORATION**

### **General**

To evaluate subsurface conditions at the site, PSI drilled nineteen (19) Standard Penetration Test (SPT) borings within the general footprint of the proposed new buildings and the swimming pool area. The SPT borings were drilled using rotary wash procedures and sampled in general accordance with ASTM D-1586. An automatic hammer was used to obtain the SPT samples. The upper 4 feet of the borings were manually augered to confirm utility clearance. SPT samples were then recovered at 5, 7 and 9 feet and sampled at 5-foot intervals thereafter to the boring termination depths of 20 to 25 feet below the existing grades.

In addition to the SPT borings, PSI drilled ten (10) manual auger borings in the proposed paved parking/drive areas. The auger borings were extended to a depth of 7 feet below existing grades. Soil samples were recovered from the auger borings at each change in soil stratum.

Upon completion of drilling, the borings were backfilled with soil cuttings. The approximate locations of the borings are presented on **Sheet 1** of the **Appendix**. The soil types encountered at the specific boring locations are presented in the form of soil profiles on **Sheets 2** through **4** of the **Appendix**. Included with the boring profiles is a legend describing the encountered soils in USCS format, measured groundwater levels and results of PSI's laboratory testing.

The stratification presented is based on visual observation of the recovered soil samples, laboratory testing and interpretation of field logs by a geotechnical engineer. It should be noted that variations in the subsurface conditions are expected and may be encountered between and away from PSI's borings. Also, whereas the individual boring logs indicate distinct strata breaks, the actual transition between the soil layers may be more gradual than shown on the soil profiles.

### **Soil Conditions**

Based on the borings PSI completed for the project, subsurface conditions are relatively consistent across the site. In general, the borings revealed a series of fine sands grading relatively clean to slightly silty, silty and clayey in composition (i.e. SP, SP-SM, SM and SC materials) from the existing ground surface to the boring termination depths of 7 to 25 feet below existing grades. Some of the sands were noted to contain cemented sands, locally known as "hardpan".

Based on the SPT blow counts recorded during our field exploration, the sands generally grade loose to medium dense and dense. A detailed description of the individual borings is shown as soil profiles on **Sheets 2** through **4** of the **Appendix**.

### **Groundwater Conditions**

At the time of our fieldwork (March 24, 27 and 30, 2020), groundwater was encountered in the borings at depths ranging on the order of 3.8 to 6.2 feet below existing grades. The estimated normal seasonal high groundwater levels presented herein are based on the observed soil stratigraphy, conditions observed in the borings, USDA Soil Survey information, and our past experience in the project vicinity. In this regard, we estimate the normal seasonal high groundwater table will occur at a depth of 1.5 to 3 feet below the existing ground surface.



In general, the estimated normal seasonal high groundwater level is not intended to define a limit or ensure that future seasonal fluctuations in groundwater levels will not exceed the estimated levels. Groundwater conditions will vary with environmental changes and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as man-made influences, such as swales, ponds, drainage systems, underdrains and areas of covered soil (buildings, paved parking lots, sidewalks, etc.).

### **SITE SUITABILITY**

Based on the results of PSI's borings, it is our opinion that subsurface conditions are generally suitable for the proposed development from a geotechnical engineering perspective. Following completion of site preparation as recommended herein, conventional shallow foundations can be used for building support. Such foundations can be designed for a net allowable bearing pressure of 3,000 pounds per square foot (psf). Provided adequate separation is maintained between the normal seasonal high groundwater table and the bottom of pavement base, pavements can be constructed using conventional asphalt or concrete sections. More detailed discussions pertaining to site preparation and our design recommendations follow.

### **SITE PREPARATION CONSIDERATIONS**

#### **General**

The following recommendations have been developed on the basis of the previously described project characteristics and subsurface conditions encountered. If there is any change in the project criteria, including the location or orientation of the proposed buildings, swimming pool and pavement areas, a review must be made by PSI to determine if additional fieldwork and/or any modifications to our recommendations will be required.

Once final design plans and specifications are available, a general review by PSI is strongly recommended as a means to check that the evaluations made in preparation of this report are correct and that earthwork and foundation recommendations are properly interpreted and implemented.

#### **Site Clearing/Stripping**

At the outset of construction, clearing and grubbing including root raking and removal of any organic-laden topsoil that remains on the site should be completed. This normally includes removing the surface vegetation, stripping topsoil, grubbing major root systems, and removing any miscellaneous debris and/or deleterious materials. At a minimum, it is recommended that the clearing/stripping operations extend at least ten feet beyond the proposed building and pavement areas wherever practical. Material generated during stripping operations should be disposed of off-site in a proper manner as directed by the Owner. Initial site clearing and preparation work should be carried out under the observation of a representative of PSI's Geotechnical Engineer.

#### **Fill Placement and Subgrade Preparation**

After completion of site clearing operations, the stripped subgrade should be densified by heavy proof rolling. Proof rolling operations should be carried out from the stripped/cleared surface with a self-propelled vibratory roller. The roller should have a drum weight of at least 10 tons. The limits of proof rolling should encompass the building footprint and pavement areas plus a horizontal distance of ten feet beyond the exterior edges of the development perimeter.



Densification of the subsoils should be accomplished by making repeated overlapping coverages of the roller as it operates at its full vibrational frequency, and at a travel speed of not more than two feet per second. Within 75 feet of existing buildings, the roller should be operated in the static mode, or vibration monitoring should be performed to assess vibration levels. Proof rolling operations should be carried out under the surveillance of a Geotechnical Engineer or his representative so that observations of the subgrade can be made and in place density tests can be taken to evaluate if compaction is being achieved. The upper 12 inches of the subgrade should be compacted to at least 95 percent of the soil's ASTM D-1557 maximum dry density.

If unstable/yielding soils are encountered by the roller, then such materials should be locally removed and replaced with clean dry granular soil (engineered fill) that is thoroughly and uniformly compacted.

### **Engineered Fill**

Any off-site fill imported for the project should consist of clean fine sand with less than 12 percent by dry weight passing the U.S. Standard No. 200 sieve and be free of rubble, organics, clay, debris and other deleterious material. Fill should be tested and approved prior to import and placement. Each lift should have a loose thickness not exceeding 12 inches. Density tests should be performed to confirm the required compaction is being achieved before placing the next lift.

Before beginning compaction, soil moisture conditioning may be required. Soil moisture contents should be controlled to facilitate proper compaction. A moisture content within two percentage points of the material's optimum indicated by the modified Proctor test (ASTM D-1557) is recommended prior to compaction of the natural ground and fill. All engineered fill should be compacted to at least 95 percent of the material's modified Proctor (ASTM D-1557) maximum dry density.

## **DESIGN RECOMMENDATIONS**

### **Foundations**

Based on the anticipated construction and recommended site preparation, shallow foundations may be designed for a net allowable bearing pressure of 3,000 pounds per square foot (psf). The foundations and floor slabs should bear on properly placed and compacted cohesionless (sand) fills or on compacted native sands. All footings should be embedded so that the bottom of the foundation is a minimum of 18 inches below adjacent finished grades on all sides. Strip and wall foundations should be a minimum of 18 inches wide, while column footings should be at least 30 inches square. If post-tensioned slabs are employed for building support, they should be designed in accordance with the governing code.

The subgrade soils should be compacted to a minimum density requirement of 95 percent of the material's modified Proctor (ASTM D-1557) maximum dry density for a minimum depth of two feet below the bottom of footings, as determined by field density compaction tests. Backfill soils placed adjacent to footings or walls should be carefully compacted with a light walk-behind roller or vibratory plate compactor to avoid damaging in-place footings or walls.

All foundation excavations should be observed by the Geotechnical Engineer or his representative to explore the extent of any fill, excessively loose, soft, or otherwise undesirable materials. If soft or undesirable materials are encountered in the footing excavations, then such materials should be removed and the subgrade re-established



by backfilling. This backfilling may be done with a well-compacted, suitable fill such as clean sand (engineered fill), lean concrete, or crushed FDOT No. 57 or FDOT No. 67 stone. Sand backfill should be compacted to at least 95 percent of the material's modified Proctor maximum dry density (ASTM D-1557), as previously described. Gravel/stone should be blended with clean sand to fill the voids within the stone matrix and should be compacted to a firm/unyielding condition.

Immediately prior to placement of reinforcing steel, it is suggested that the bearing surfaces of all footing and floor slab areas be re-compacted using hand operated mechanical tampers. In this manner, any localized areas that have been loosened by excavation operations should be adequately re-compacted.

Provided the recommended subgrade preparation operations presented herein are properly performed, total foundation settlement for the buildings should be less than 1 inch. Differential settlements should be approximately 50 percent of the total movements. These estimates are based on foundation loads discussed herein. The settlement of shallow foundations supported on sandy soils should occur relatively quickly after initial loading. Thus, the majority of expected settlement should occur during construction as dead loads are imposed.

Lateral loads that are applied to the foundations may be resisted by earth pressure mobilized on the buried vertical faces of the footings and by shearing forces acting along the footing-subgrade interface. Earth pressure resistance may be determined using an equivalent fluid density of 360 pounds per cubic foot (pcf) for moist soil and 180 pcf for submerged soil. A friction factor of 0.4 should be used to determine base shearing resistance.

The above values presume that the foundations are surrounded by well-compacted sand backfill and can withstand horizontal movements on the order of one-quarter to three-eighths inches. Horizontal restraint determined in accordance with the recommended values should be considered resistance that is available rather than allowable. Therefore, the design should incorporate a factor of safety and we recommend that this be taken as 1.5 or somewhat more.

### **Floor Slabs**

Floor slabs can be safely supported as slab-on-grade systems provided the final subgrade elevation is densified and prepared as recommended herein. We further recommend that the upper one foot of the subgrade soils within the building pads be compacted to at least 95 percent of the maximum dry density of the soil's modified Proctor (ASTM D-1557).

We recommend the floor slab bearing soils be covered by lapped polyethylene sheeting in order to reduce the potential for floor dampness which can affect the performance of flooring materials. This membrane should consist of a minimum six mil thick, single layer of non-corroding, non-deteriorating sheeting material placed to minimize seams and to cover all of the soil below the building floor slabs. Seams should be overlapped a minimum of 12 inches.

For slab design, we recommend a subgrade modulus of 150 pounds per cubic inch (pci) for subgrade prepared as noted herein.



### **Pavement Support**

Pavements for the project will include driveways and parking areas. Provided that pavements are designed to provide at least 18 inches of clearance between the bottom of the base material and the estimated normal season high groundwater table, the basecourse for asphalt sections can comprise limerock or crushed concrete. Recommendations for pavement sections for light-duty and medium-duty sections are included in the following.

#### **Light-Duty (Car Parking Areas)**

1.5 inches	Type SP Asphaltic Concrete
6.0 inches	Limerock/crushed concrete basecourse (LBR = 100)
12.0 inches	Stabilized subgrade (LBR = 40)

#### **Medium-Duty (Driveways)**

2.0 inches	Type SP Asphaltic Concrete
8.0 inches	Limerock/crushed concrete basecourse (LBR = 100)
12.0 inches	Stabilized subgrade (LBR = 40)

For heavy-duty uses, such as in the dumpster pads/approaches and other areas subjected to truck traffic, we recommend the following minimum rigid pavement section.

#### **Heavy-Duty (Rigid Pavement)**

7.0 inches	Portland cement concrete, minimum 28 day compressive strength of 4000 psi.
12.0 inches	Well-draining granular subgrade, compacted to 98 percent of the material's AASHTO T-180 maximum dry density.

Pavement joints and reinforcing for concrete pavement should be in accordance with American Concrete Institute (ACI) standards. The recommended pavement sections are based on past experience with similar projects and the encountered subsurface conditions at the site. All pavement materials and construction should meet the more stringent of the Florida Department of Transportation (FDOT) and local city/county requirements. The noted pavement sections should be considered recommended minimums based on anticipated traffic loadings and our past experience. Once design traffic loading data is available for the project, PSI can provide supplemental pavement design services.



## **OTHER CONSIDERATIONS**

### **Below-Grade Walls**

Below-grade walls for the project should be designed to resist pressures exerted by the adjacent soils and hydrostatic head. For walls that are not restrained during backfilling but are free to rotate at the top, active earth pressure should be used in design. Walls that are restrained should be designed assuming at-rest pressures. Recommended soil parameters for the near-surface granular soils encountered at the site are presented below.

Total Unit Weight, $\gamma_b$	=	120 lb/ft <sup>3</sup>
Angle of Internal Friction, $\phi$	=	30°
Coeff. of Sliding Friction	=	0.40
Active Soil Pressure coeff., $K_a$	=	0.33
At-rest Soil Pressure coeff., $K_o$	=	0.50
Passive Soil Pressure coeff., $K_p$	=	3.00

The recommended parameters assume that adequate drainage is provided behind the walls to prevent the buildup of excess hydrostatic pressures. The design should incorporate hydrostatic effects. In order to avoid wall damage due to excessive compaction, hand operated mechanical tampers should be used to densify backfill soils; heavy compaction equipment should not be allowed within five feet of walls. The soils behind walls should be compacted to approximately 95 percent of the material's modified Proctor (ASTM D-1557) maximum dry density.

### **Swimming Pool**

The shallow seasonal high groundwater levels in the project site needs to be taken into consideration for the design of the swimming pool. The pool shell should be designed to resist potential unbalanced hydrostatic pressures. To allow for emptying the pool for periodic maintenance, we suggest that an underdrain system be installed below the pool to control hydrostatic/buoyancy pressures.

### **Utility Construction**

All utility excavations should be made in accordance with recommendations outlined by the Occupational Safety and Health Administration Document *Construction Standards for Excavations (29CFR Part 1926.650-.652 Subpart P)*. Shoring should be designed in accordance with OSHA 2226, taking into consideration loads resulting from equipment, existing construction and/or fill stockpiles.

Difficulty may arise during construction when trying to compact materials containing higher percentages of fines. If those soils become unstable during compaction operations due to moisture related conditions, we recommend those soils be undercut at least 12 inches below pipe inverts and drainage structures and the resultant excavation be infilled with compacted clean fine sand with less than 10 percent by dry weight passing the No. 200 sieve and gravel bedding of Florida Department of Transportation (FDOT) crushed stone (No. 57 stone). Utility bedding material should be an equal mixture of No. 57 stone and clean sand. Gravel/sand backfill should be compacted such that it is firm and unyielding. Unsuitable soils should be removed for the full width of the trench and to the depth required to reach suitable utility foundation material.



### **Excavations**

In Federal Register, Volume 54, No. 209 (October 1989) the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to insure better the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, general construction excavations or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed the Owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.

### **LIMITATIONS**

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This company is not responsible for the conclusions, opinions or recommendations made by others based on these data.

The scope of our exploration was intended to evaluate soil conditions within the influence of the proposed multi-family apartment buildings and the associated civil infrastructure and does not include an evaluation of potential deep soil problems such as sinkholes. The analysis and recommendations submitted in this report are based on the data obtained from the soil borings performed at the locations indicated. If any subsoil variations become evident during the course of this project, a re-evaluation of the recommendations contained in this report will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the proposed development.

The scope of our geotechnical services presented herein does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of our client.





### CLOSURE

PSI appreciates the opportunity to provide our services to you on this project. If you have any questions regarding the information provided in this report, or if we may be of further service, please contact the undersigned.

Respectfully submitted,

**PROFESSIONAL SERVICE INDUSTRIES, INC.**  
**Certificate of Authorization No. 3684**

Venkata Prashanth Muppana, M.S., E.I.  
Staff Engineer

Robert A. Trompke, P.E.  
Florida Geotechnical Practice Leader  
Florida License No. 55456

07572421 (Westwood Apartments, Inwood).docx

cc: Mr. Scott Marsolek – Lajolla Construction Management  
Mr. Doyle Smith, P.E. – PSI

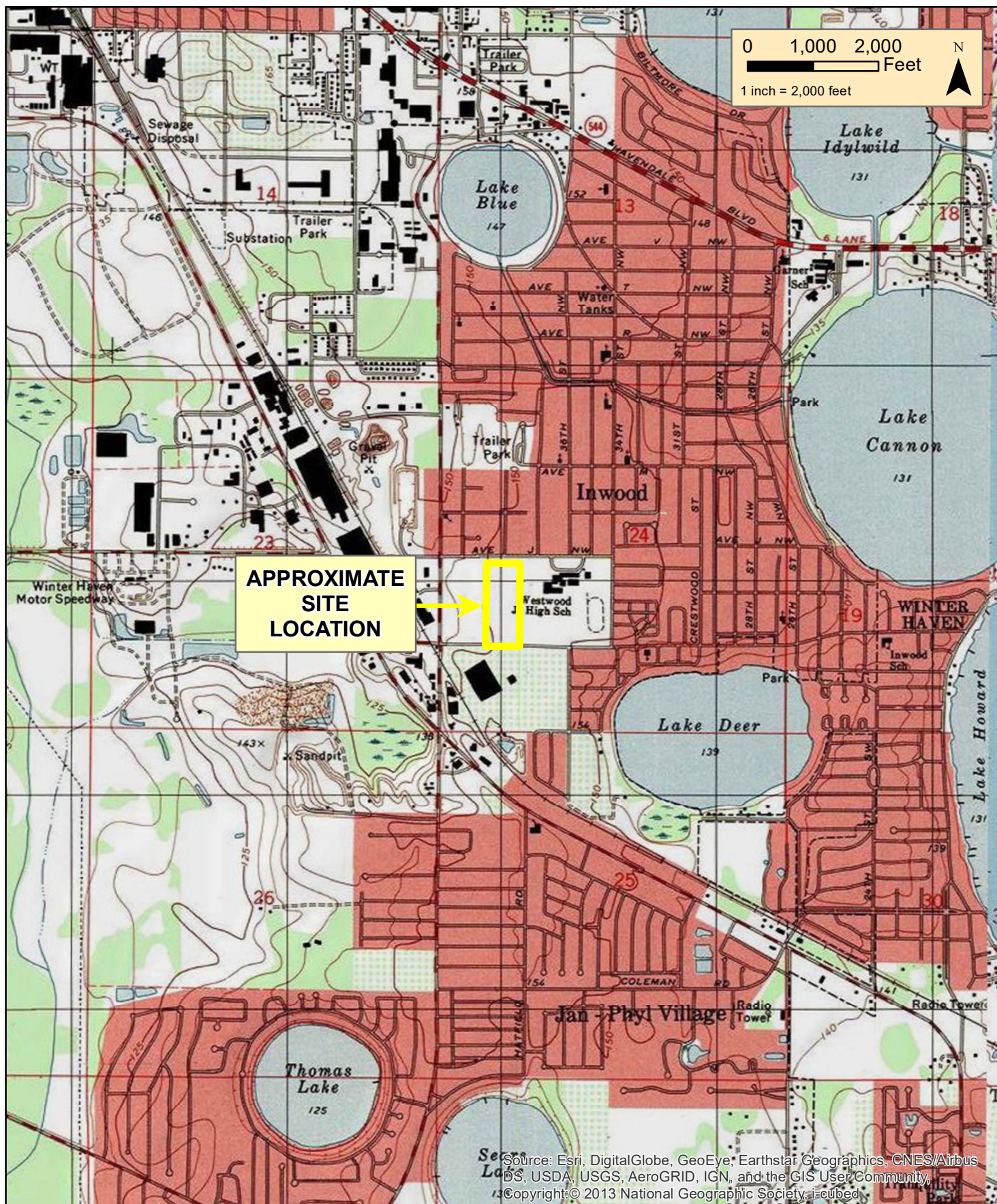
#### Appendix

- Figure 1 – USGS Topographic Map
- Figure 2 – NRCS Soil Survey Map
- Sheet 1 – Boring Location Plan
- Sheets 2 through 4 – Boring Profiles



## APPENDIX

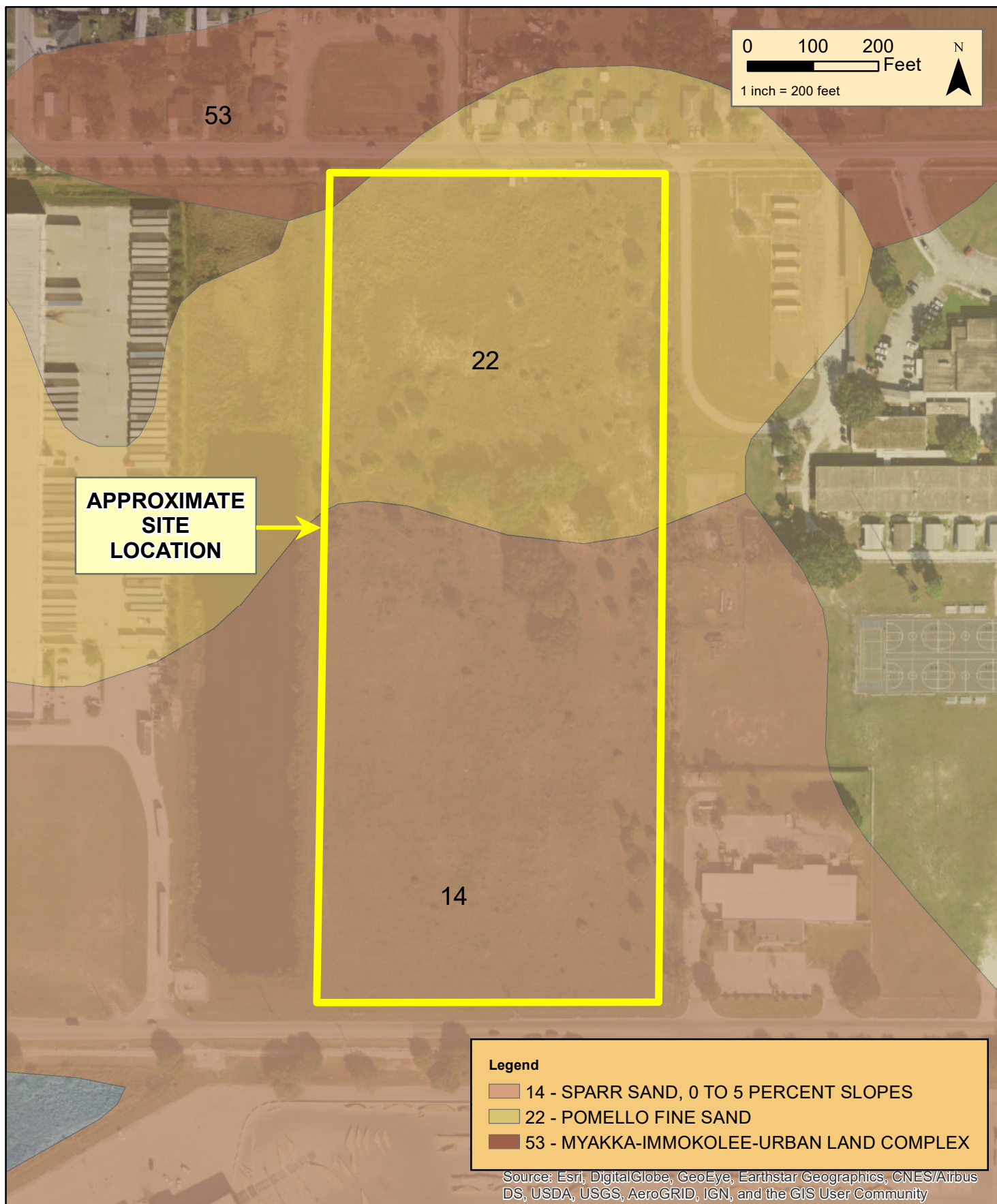




REFERENCE: THE 2017 AERIAL PHOTOGRAPH WAS OBTAINED FROM ESRI. THE PRESENTED DATA IS FOR INFORMATIONAL PURPOSES ONLY. IT IS NOT MEANT FOR DESIGN, LEGAL, OR ANY OTHER USES. INTERTEK-PSI ASSUMES NO RESPONSIBILITY FOR ANY DECISIONS MADE OR ANY ACTIONS TAKEN BY THE USER BASED UPON INFORMATION OBTAINED FROM THE ABOVE DATA.

PROJECT NO. <b>07572421</b>	<b>intertek</b> <b>psi</b>	1748 33rd Street Orlando, FL 32839 (407)304-5560 (407)304-5561 fax	<b>TOPOGRAPHIC MAP</b>  <b>WESTWOOD APARTMENTS</b>  INWOOD, FLORIDA	FIGURE: <b>1</b>
TWNRNG/SEC <b>28S/25E/24</b>				DRAWN: <b>DJW</b>
DATE CREATED <b>4-2-20</b>				CHECKED: <b>VM</b>

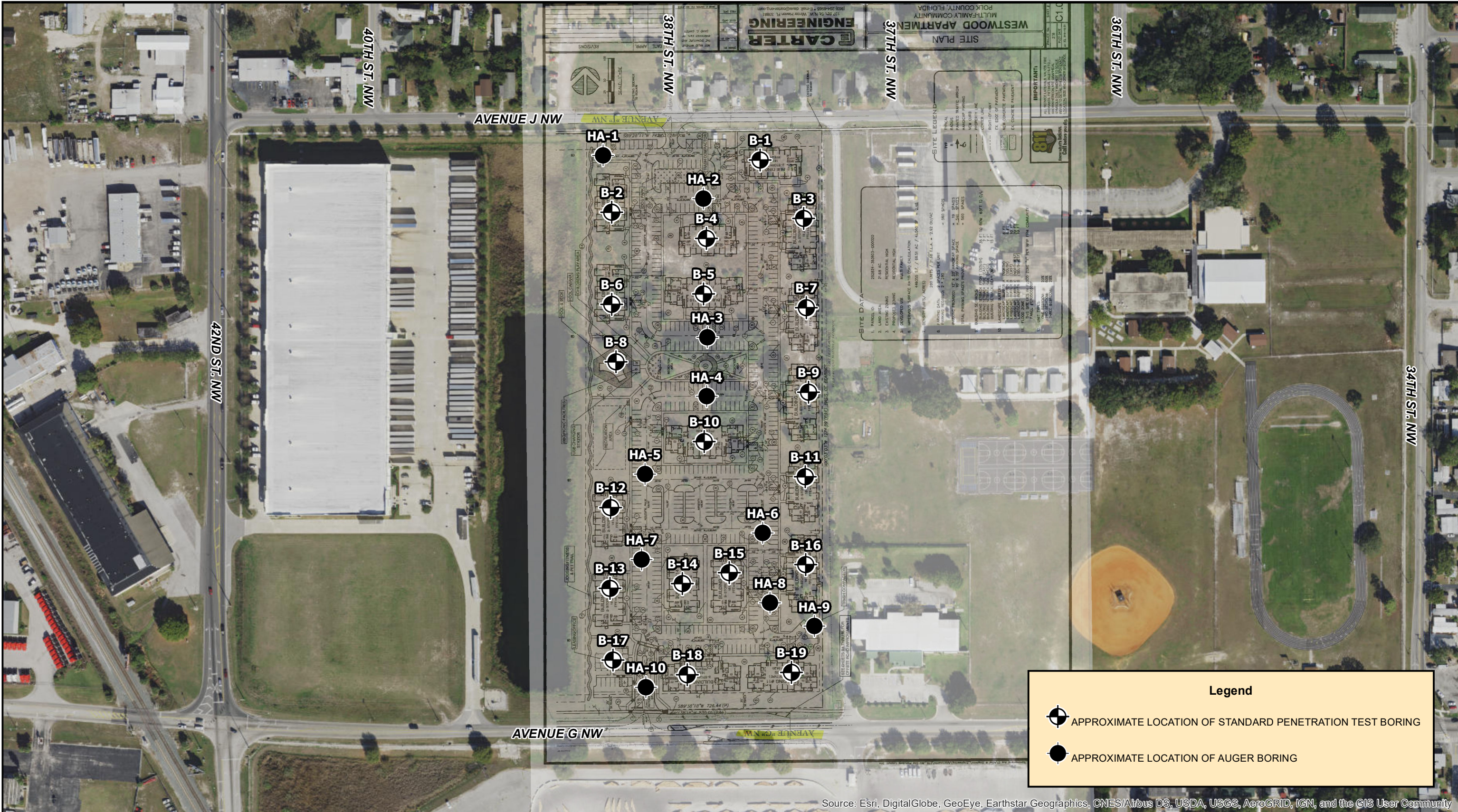




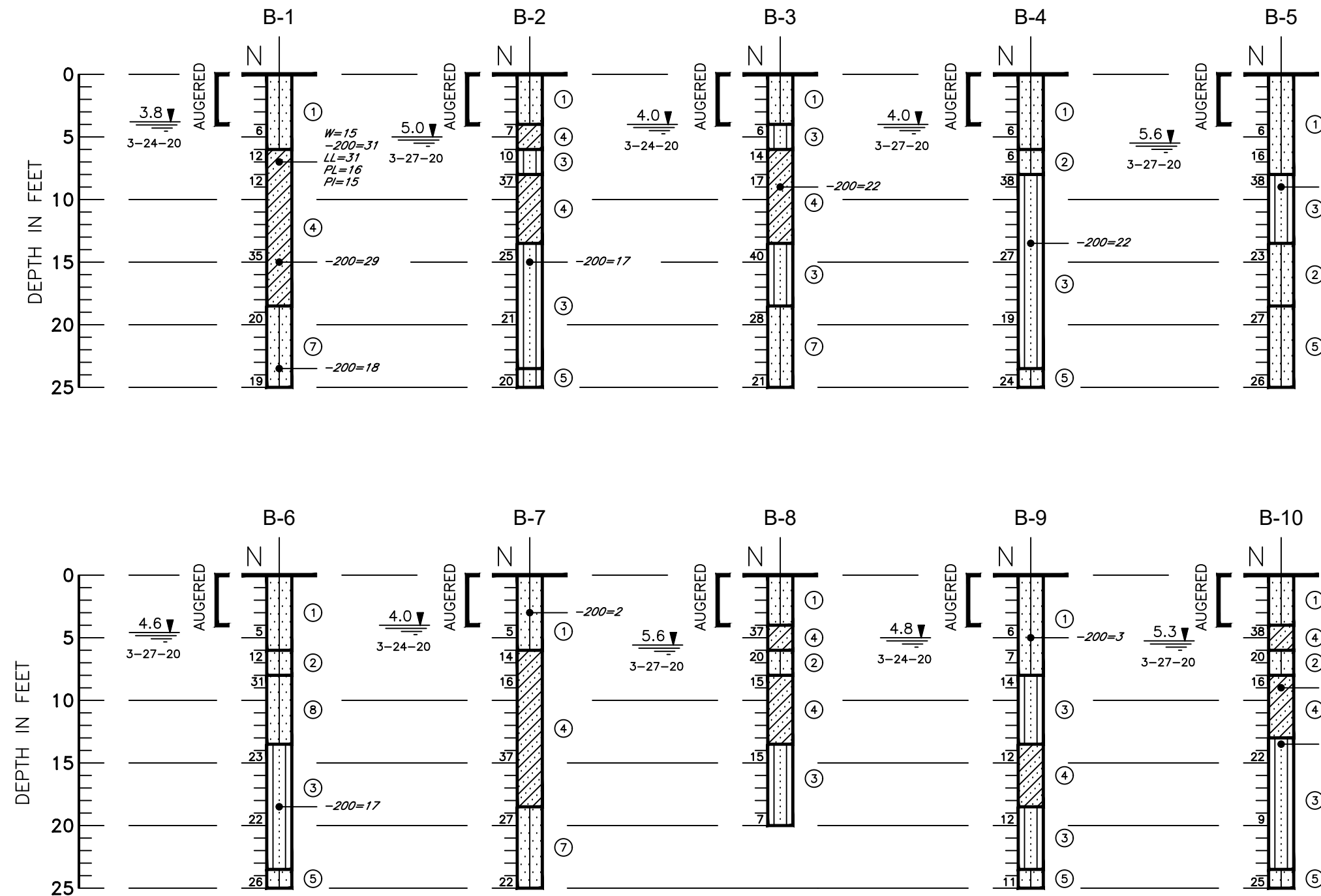
REFERENCE: THE 2017 AERIAL PHOTOGRAPH WAS OBTAINED FROM ESRI. THE PRESENTED DATA IS FOR INFORMATIONAL PURPOSES ONLY. IT IS NOT MEANT FOR DESIGN, LEGAL, OR ANY OTHER USES. INTERTEK-PSI ASSUMES NO RESPONSIBILITY FOR ANY DECISIONS MADE OR ANY ACTIONS TAKEN BY THE USER BASED UPON INFORMATION OBTAINED FROM THE ABOVE DATA.

PROJECT NO. <b>07572421</b> TOWN/RNG/SEC <b>28S/25E/24</b> DATE CREATED <b>4-2-20</b>	 1748 33rd Street Orlando, FL 32839 (407)304-5560 (407)304-5561 fax	SOILS MAP  <b>WESTWOOD APARTMENTS</b>  INWOOD, FLORIDA		FIGURE: <b>2</b> DRAWN: <b>DJW</b> CHECKED: <b>VM</b>
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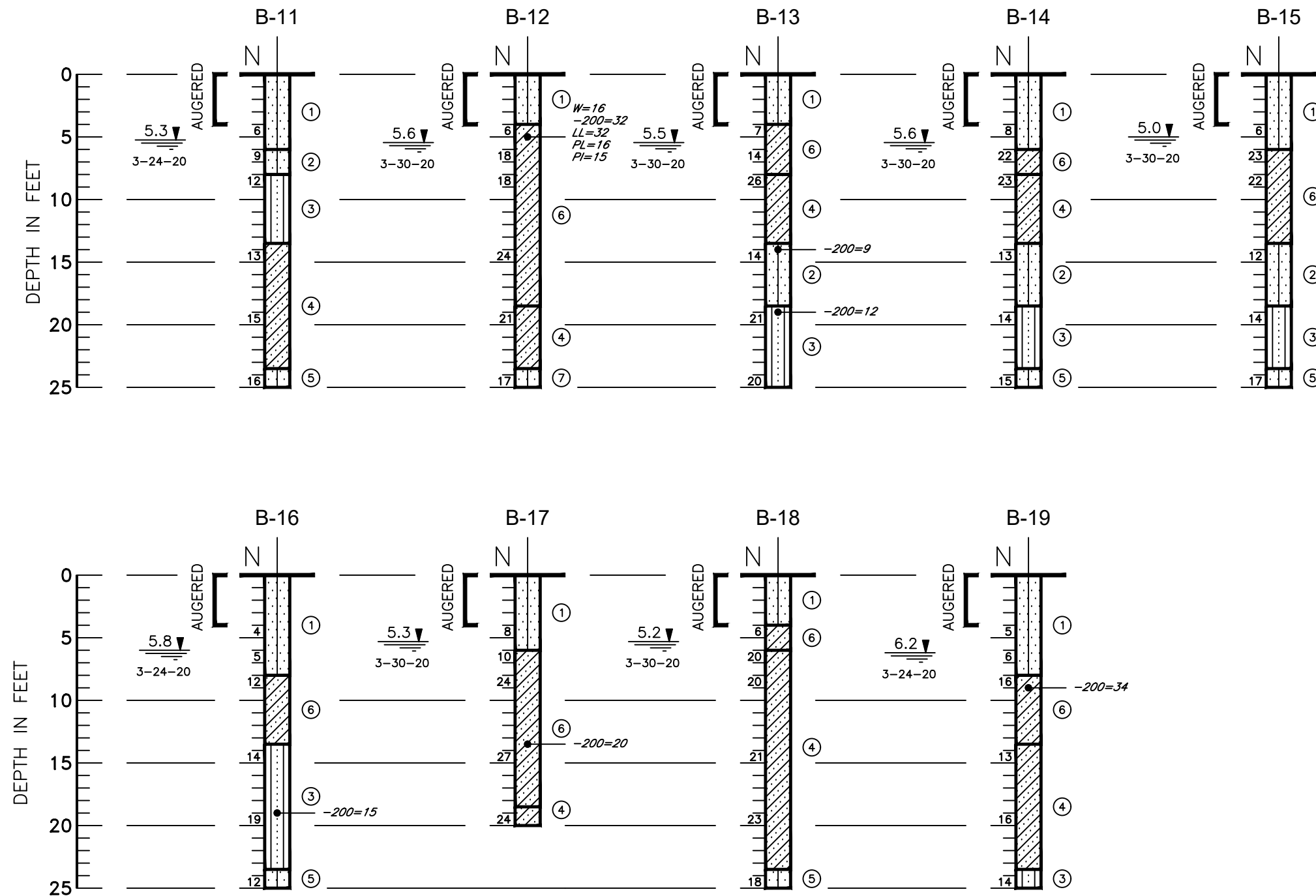






- LEGEND**
- ① LIGHT GRAY-BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
  - ② LIGHT BROWN TO BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
  - ③ LIGHT GRAY-BROWN TO BROWN SILTY FINE SAND, (SM)
  - ④ LIGHT GRAY-BROWN CLAYEY FINE SAND, (SC)
  - ⑤ LIGH GRAY TO BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
  - ⑥ RED-BROWN CLAYEY FINE SAND, (SC)
  - ⑦ DARK BROWN TO BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
  - ⑧ DARK BROWN TO RED-BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, TRACE HARDPAN, (SP), (SP-SM)
- (SP) UNIFIED SOIL CLASSIFICATION GROUP SYMBOL
- N STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT USING AN AUTOMATIC HAMMER
- 3.8 ▽ 3-24-20 DEPTH TO GROUNDWATER LEVEL IN FEET WITH DATE OF READING
- W NATURAL MOISTURE CONTENT IN PERCENT
- 200 FINES PASSING #200 SIEVE IN PERCENT
- LL LIQUID LIMIT IN PERCENT
- PL PLASTIC LIMIT IN PERCENT
- PI PLASTICITY INDEX

**SOIL PROFILES**  
SCALE: 1"=10'



**SOIL PROFILES**  
SCALE: 1"=10'

LEGEND	
	① LIGHT GRAY-BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
	② LIGHT BROWN TO BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
	③ LIGHT GRAY-BROWN TO BROWN SILTY FINE SAND, (SM)
	④ LIGHT GRAY-BROWN CLAYEY FINE SAND, (SC)
	⑤ LIGH GRAY TO BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
	⑥ RED-BROWN CLAYEY FINE SAND, (SC)
	⑦ DARK BROWN TO BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
	⑧ DARK BROWN TO RED-BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, TRACE HARDPAN, (SP), (SP-SM)
(SP)	UNIFIED SOIL CLASSIFICATION GROUP SYMBOL
N	STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT USING AN AUTOMATIC HAMMER
	DEPTH TO GROUNDWATER LEVEL IN FEET WITH DATE OF READING
W	NATURAL MOISTURE CONTENT IN PERCENT
-200	FINES PASSING #200 SIEVE IN PERCENT
LL	LIQUID LIMIT IN PERCENT
PL	PLASTIC LIMIT IN PERCENT
PI	PLASTICITY INDEX

PROJECT NO.  
**07572421**  
SCALE:  
**NOTED**  
DATE CREATED:  
**4-2-20**



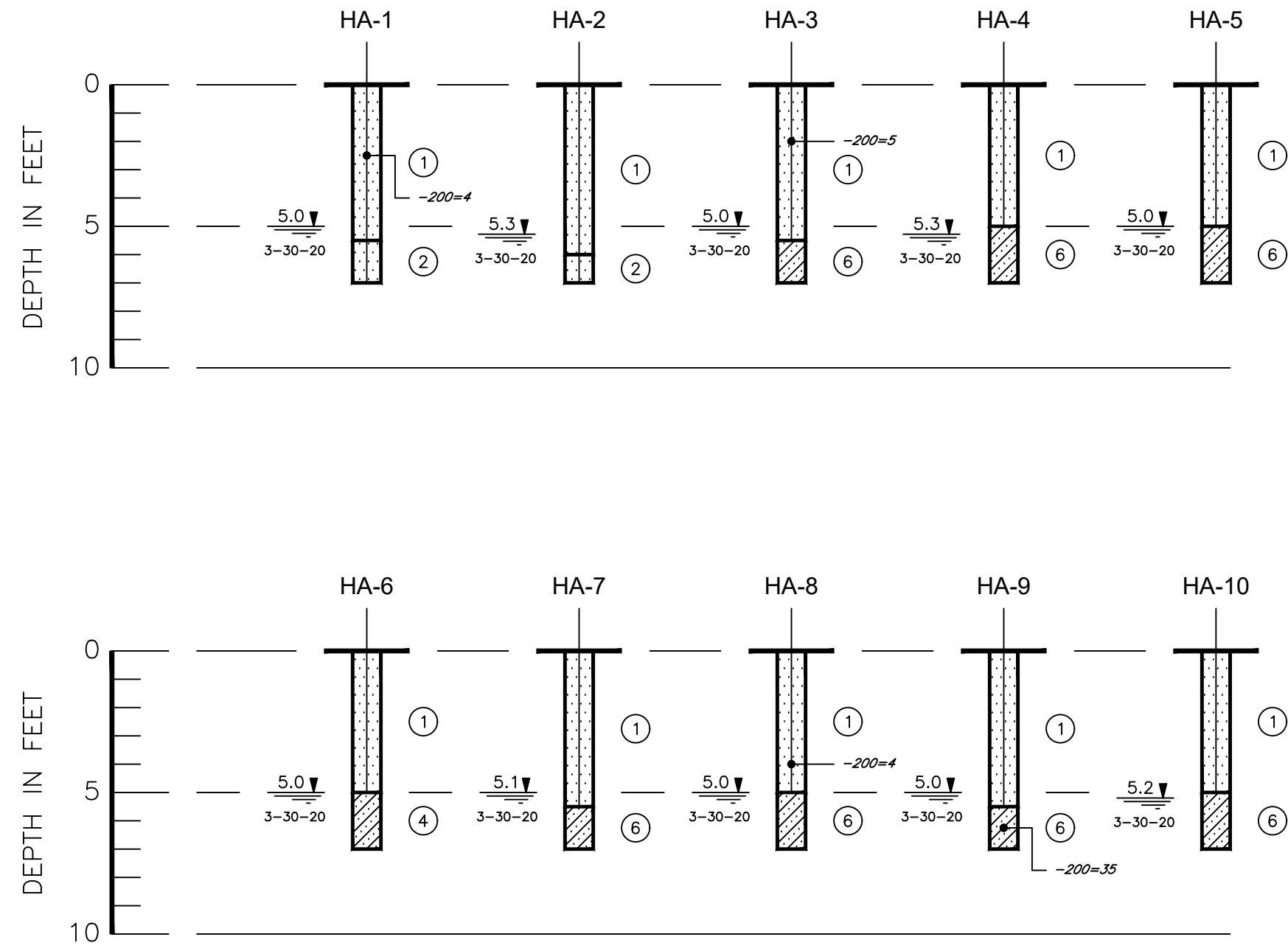
1748 33rd Street  
Orlando, FL 32839  
(407)304-5560  
(407)304-5561 fax

GEOTECHNICAL ENGINEERING SERVICES

**WESTWOOD APARTMENTS**

INWOOD, FLORIDA

SHEET:  
**3**  
DRAWN:  
**DJW**  
CHECKED:  
**VM**



- LEGEND**
- (1) LIGHT GRAY-BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
  - (2) LIGHT BROWN TO BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
  - (3) LIGHT GRAY-BROWN TO BROWN SILTY FINE SAND, (SM)
  - (4) LIGHT GRAY-BROWN CLAYEY FINE SAND, (SC)
  - (5) LIGH GRAY TO BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
  - (6) RED-BROWN CLAYEY FINE SAND, (SC)
  - (7) DARK BROWN TO BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
  - (8) DARK BROWN TO RED-BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, TRACE HARDPAN, (SP), (SP-SM)
- (SP) UNIFIED SOIL CLASSIFICATION GROUP SYMBOL
- 3.8  
3-24-20 DEPTH TO GROUNDWATER LEVEL IN FEET WITH DATE OF READING
- 200 FINES PASSING #200 SIEVE IN PERCENT

**SOIL PROFILES**  
SCALE: 1"=5'



Bid Form - General Contract

TO: D4AVEG, LLC  
1775 Wittington Place  
Suite 340  
Dallas, TX 75234

DATED: \_\_\_\_\_, 2019

Having carefully examined the Invitation and Instructions to Bidders, the General Conditions of the Contract and Specifications entitled "A New Development for: Westwood at Winterhaven, Avenue "G" N.W., Winter Haven, FL 33881, HUD #067-35554" and the Drawings similarly entitled, as well as the premises and conditions affecting the work, the Undersigned proposes to furnish all materials and labor called for by them for the work in accordance with said documents for the sum of:

\_\_\_\_\_ Dollars (\$\_\_\_\_\_).

hereinafter referred to as the Base Bid.

If written notice of the acceptance of this bid is mailed, telegraphed, or delivered to the Undersigned within sixty (60) days after the date of receipt of bids or at anytime thereafter before this bid is withdrawn, the Undersigned agrees that he will execute and deliver a Contract on the forms which will be provided him in accordance with bid as specified; and that he will give performance and payment bonds as specified with good and sufficient surety or sureties all within ten (10) days, unless a longer period is allowed after the prescribed forms are presented to him for signature.

The Bidder proposes to complete the work within \_\_\_\_\_ consecutive calendar days from the Notice to Proceed. The Bidder, by submitting this Bid, agrees to furnish labor, materials, plant, equipment, etc., necessary to complete the work by the above stated dates and to accept the conditions for liquidated damages in the amount of **Eight Hundred Dollars (\$800.00)** per calendar day. The above stated dates for completion of this project are of utmost importance to the Owner.

The Undersigned hereby acknowledges receipt of all Contract Documents including all pages of the Specifications, all sheets of the Drawings, and the following Addenda:

Addendum No. \_\_\_\_ Date: \_\_\_\_\_ Addendum No. \_\_\_\_ Date: \_\_\_\_\_

Addendum No. \_\_\_\_ Date: \_\_\_\_\_ Addendum No. \_\_\_\_ Date: \_\_\_\_\_

Addendum No. \_\_\_\_ Date: \_\_\_\_\_ Addendum No. \_\_\_\_ Date: \_\_\_\_\_

Sincerely,

\_\_\_\_\_  
Bidder (If by a Corporation, this Bid must have the Signature Required by its By-Laws)

\_\_\_\_\_  
Title

\_\_\_\_\_  
Firm Name

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

\_\_\_\_\_  
Official Address

End of Bid Form

**THIS FORM MUST BE FIRMLY ATTACHED TO THE OUTSIDE OF THE ENVELOPE CONTAINING THE BID. NO BID WILL BE CONSIDERED IF THIS FORM IS INCOMPLETE OR NOT ATTACHED TO THE OUTSIDE OF THE BID ENVELOPE.**

<b>To:</b>	D4AVEG, LLC 1775 Wittington Place, Suite 340 Dallas, TX 75234	<b>PROJECT:</b>	A New Development for: Westwood at Winterhaven Apartments Winter Haven, FL., 33881 HUD #067-35554
<b>DATE:</b>		<b>TIME:</b>	
<b>LOCATION:</b>			

<b>NAME OF BIDDER:</b>		<b>BIDDER'S LICENSE CLASSIFICATION:</b>	
<b>LICENSE NO.:</b>	<i>(If bidder is licensed in more than one classification that applies to work being bid, include the license number, classification &amp; expiration date of all classifications)</i>	<b>EXPIRATION DATE:</b>	
		<b>MONETARY LIMITS:</b>	

**PART II: IF THE BID INVOLVES: (1) ELECTRICAL WORK, (2) PLUMBING WORK, (3) HEATING, VENTILATION OR AIR CONDITIONING WORK, (4) MASONRY WORK, OR (5) GEOTHERMAL WORK, THE BIDDER MUST COMPLETE PART II. IF NOT, ENTER "NONE" IN THE SPACE FORM ITEM (A) BELOW.**

<b>Electrical</b>	<b>Plumbing</b>	<b>HVAC</b>	<b>Masonry</b>	<b>Geothermal</b>
A. Name of Sub holding electrical license:	A. Name of Sub holding plumbing license:	A. Name of Sub holding HVAC license:	A. Name of Sub holding Masonry license:	A. Name of Sub holding Geothermal license:
B. License No. of Contractor holding electrical license:	B. License No. of Contractor holding plumbing license:	B. License No. of Contractor holding HVAC license:	B. License No. of Contractor holding Masonry license:	B. Lic.No. of Contractor holding Geothermal license:
C. License classification and limits:	C. License classification and limits:	C. License classification and limits:	C. License classification and limits:	C. License classification and limits:
D. Expiration date of electrical license:	D. Expiration date of plumbing license:	D. Expiration date of HVAC license:	D. Expiration date of Masonry license:	D. Expiration date of Geothermal license:

SECTION 00 48 20 - Authorization to do Business in Florida

Non-Florida resident companies wishing to do business with City of Winter Haven/Polk County must have proof of a current Certificate of Authority from the Florida Secretary of State office before entering into any acquisition agreement or contract with the County per Code of Florida Title XXXVI, Chapter 607 of the Florida Business Corporation Act. Application forms for this certificate can be downloaded from the Secretary of State web site <https://dos.myflorida.com/> or by phoning 850-245-6000.

SECTION 00 48 60 - DRUG-FREE WORKPLACE AFFIDAVIT OF PRIME BUILDER

State of \_\_\_\_\_ )  
 ) ss.  
County of \_\_\_\_\_ )

Comes the affiant after having first been duly sworn and testifies as follows:

1. My name is \_\_\_\_\_ I hold the principal office of  
\_\_\_\_\_ for \_\_\_\_\_  
(Name of Principal Office) (Name of Bidding Entity)

2. \_\_\_\_\_ has submitted a bid  
for "A New Development for: Westwood at Winterhaven Apartments, Avenue "G" N.W., Winter  
Haven, FL 33881, HUD #067-35554".

3. \_\_\_\_\_ employs more than five (5) employees.  
(Name of Bidding Entity)

4. In accordance with Code of Florida, Title X, Chapter 112, this is to certify that  
\_\_\_\_\_ has in effect at the time of its submission of a bid  
(Name of Bidding Entity)  
to perform the construction of the \_\_\_\_\_ Housing Authority project identified above, a  
drug-free workplace program that complies with the Florida statute 112.0455, "Drug Free  
Workplace Act".

5. This affidavit is made on personal knowledge.

Further the affiant saith not this \_\_\_\_\_ day of \_\_\_\_\_,

Signed \_\_\_\_\_

Title \_\_\_\_\_

SWORN TO and subscribed before me

This \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
Notary Public

By: \_\_\_\_\_

Title: \_\_\_\_\_

My Commission Expires: \_\_\_\_\_, \_\_\_\_\_.

End of Section

## Contractor's Request for Information (RFI)

Project Name:	Contract No.:	Date:	RFI No.:
Contractor's Name:	To:		
Subject:			

### References

Area(s):
Specification Section(s):
Drawing No.:
Other References:
Problem / Information Requested:

Information Requested by:

Reply needed by:

Contractor's Interpretation and Proposed Resolution:

### Architect's / Engineer's Evaluation and Response

Disposition:	Clarification Only	Sketch or Drawing	Other
Approval:	Project Manager	Owner	Contractor

# Submittal Cover Sheet

Submittal No.:

Project Title:

Architect's Comm. No.:

Contractor:

Date:

Project Manager:

Phone:

Fax:

Email:

Spec Section Title:

Section No.:

Sub / Supplier:

Phone:

YES NO

☐☐

Product is as Specified

If not as specified attach Substitution request form  
Section 00 63 25

Remarks:

## Contractor's Stamp

Required for Architect's Review



## SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS LIST

Project: \_\_\_\_\_  
\_\_\_\_\_  
To (A/E): \_\_\_\_\_  
\_\_\_\_\_

From (Contractor): \_\_\_\_\_  
Date: \_\_\_\_\_  
A/E Project Number: \_\_\_\_\_  
Contract For: \_\_\_\_\_

List Subcontractors and Major Material Suppliers proposed for use on this Project as required by the Construction Documents. Attach supplemental sheets if necessary.

Section Number	Section Title	Firm	Address	Phone Number (Fax Number)	Contact
-------------------	------------------	------	---------	------------------------------	---------

☐ Attachments

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

Copies: ☐ Owner ☐ Consultants ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ File

## SUBSTITUTION REQUEST

TO: \_\_\_\_\_

PROJECT: "A New Development for: Westwood at Winterhaven Apartments, Avenue "G" N.W., Winter Haven, FL 33881, HUD #067-35554"

SPECIFIED ITEM:

Section	Page	Paragraph	Description
---------	------	-----------	-------------

The undersigned request consideration of the following:

PROPOSED SUBSTITUTION: \_\_\_\_\_

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The undersigned certifies that the following statements, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on Drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by: \_\_\_\_\_

For use by the A/E: \_\_\_\_\_

Signature: \_\_\_\_\_

Firm: \_\_\_\_\_

Approved \_\_\_\_\_ Approved as noted \_\_\_\_\_

Address: \_\_\_\_\_

Not Approved \_\_\_\_\_ Received too late \_\_\_\_\_

By: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_

Telephone: \_\_\_\_\_

Remarks: \_\_\_\_\_

Attachments



# Michael Brady Incorporated Electronic Release Form

At your request, Michael Brady Inc. (MBI) will provide electronic files for your convenience and use in the preparation of documents related to \_\_\_\_\_, subject to the following terms and conditions:

## Electronic File(s) Transfer Fees are based on the following:

- ☐ **Adobe PDF format:** \$60.00 for the first drawing/file and \$30.00 for each additional drawing/file will be required. This fee is payable in advance and by credit card only.
- ☐ **Autodesk DWF format:** \$60.00 for the first drawing/file and \$30.00 for each additional drawing/file will be required. This fee is payable in advance and by credit card only.
- ☐ **Autodesk 2010 AutoCAD DWG format:** \$80.00 per drawing/file. This fee is payable in advance and by credit card only.
- ☐ **Autodesk 2010 Revit RVT format(if available):** ☐\$1500.00 Architectural model/file ☐\$1000.00 Structural model/file ☐\$1000.00 Mechanical model/file ☐\$1000 Plumbing model/file ☐\$1000.00 Electrical model/file ☐\$1000.00 Fire protection model ☐ \$4000.00 all model sets. This fee is payable in advance and by credit card only.  
Large requests will be evaluated for the effort required to bundle and transfer the information and will be assessed on a case by case basis.

MBI makes no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced software.

Data contained on these electronic files is part of MBI's instruments of service and shall not be used by you or anyone else receiving this data through or from you for any purpose other than as a convenience in the preparation of documents pertaining to the referenced project. Any use by you or others, will be your sole risk and without liability or legal exposure to MBI. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against MBI, its officers, directors, employees, agents or sub-consultants which may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold harmless MBI from all claims, damages, losses and expenses, including attorney's fees arising out of or resulting from your use of these electronic files.

These electronic files are not Contract Documents. Significant differences may exist between these electronic files and corresponding hard copy Contract Documents due to addenda, change orders or other revisions. MBI makes no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed Contract Documents prepared by MBI and Electronic Files, signed Contract Documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the Contract Documents, including and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other Contractors for the project.

The fees listed above are for costs to un-archive, gather and transmit files only, and under no circumstances shall delivery of the electronic files for use by you be deemed a sale of the file(s) by MBI and MBI makes no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall MBI be liable for any loss of profit or any consequential damages. Usage by any parties of the data contained in the electronic files released shall constitute agreement to these terms.

Any requests for updated electronic files shall incur additional charges.

Please return this completed form by facsimile at the following number (865) 584-5213. Once the fees have been paid, the file(s) will be transferred to the indicated e-mail address and a receipt will be returned by mail.

Transfer Fee Amount: \_\_\_\_\_

Email Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Method of Payment: \_\_\_\_\_ VISA \_\_\_\_\_ MasterCard \_\_\_\_\_ AMEX

Visa Code (Last 3 digits on back of card) \_\_\_\_\_ AMEX (4 digits on front of card) \_\_\_\_\_

Credit Card Number and Expiration Date: \_\_\_\_\_

Name & Address of Cardholder: \_\_\_\_\_

Cardholder Signature & Date \_\_\_\_\_

# DRAFT AIA® Document A201™ – 2017

## General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

<< >>  
<< >>

THE OWNER:

(Name, legal status and address)

<< >>< >>  
<< >>

THE ARCHITECT:

(Name, legal status and address)

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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 mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

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

### ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

#### § 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the 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.



## SECTION 00 73 00 - SUPPLEMENTARY CONDITIONS

### 1PART I GENERAL:

- 1.01 The following amendments modify, change, delete from or add to the General Conditions of the Contract for Construction (AIA Document A201, 2017 Edition), hereinafter referred to as the General Conditions. Where any part of the General Conditions is modified or voided by these amendments the unaltered provisions of that part shall remain in effect.

#### 1.02 INTENT OF CONTRACT DOCUMENTS:

- A. Add the following Subparagraphs 1.2.4 and 1.2.5 at the end of Paragraph 1.2, Execution, Correlation, and Intent:

**1.2.4 If there is any conflict or discrepancy within or between any of the Contract Documents involving the quality or quantity of work required, it is the intention of the Contract that the work of highest quality or greatest quantity shown or specified shall be furnished,** unless such conflict or discrepancy shall have been brought to the Architect's attention and clarified by Addendum prior to the opening of bids.

**1.2.5 Whether or not the word "ALL" is used in the specifications, coverage is intended to be complete, except where partial coverage is specifically and expressly noted. In all cases where an item is referred to in the singular number, it is intended that the reference shall apply to as many such items as are required to complete the work. Words such as "Install", "Provide", "Furnish", and "Supply" shall be construed as meaning complete furnishing, installing, and constructing unless modified by additional information.**

#### 1.03 DOCUMENTS FURNISHED TO THE CONTRACTOR:

- A. Add Subparagraph 2.2.5 to read as follows: Copies of the Drawings and Specifications will be available to the General Contractor at the cost of reproduction subject to the provisions of Paragraph 1.5, Ownership and use of Drawings, Specifications, and other Instruments of Service. All Drawings and Specifications furnished to the Contractor shall be subject to the provisions of Paragraph 1.5, Ownership and use of Drawings, Specifications, and other Instruments of Service.
- B. Add Subparagraph 2.2.6 at the end of Paragraph 2.2, Information and Services Required of the Owner:

**2.2.6 Electronic data files produced by the Architect containing information about the project are instruments of service and shall be subject to the provisions of Paragraph 1.5, Ownership and use of Drawings, Specifications, and other Instruments of Service. Electronic data files are not Contract Documents and differences may exist between these electronic files and the hard copy documents issued as Contract Documents. These files may be made available to the Contractor for convenience in preparing documents relating to the project upon execution of an electronic files release and payment of transfer fees as stated in the electronic files release.**

#### 1.04 REVIEW OF CONTRACT DOCUMENTS:

- A. Add the following Subparagraph 3.2.5 at the end of Paragraph 3.2, Review of Contract Documents and Field Conditions by Contractor:

**3.2.5 Should discrepancies or conflicts in the requirements of the Drawings and Specifications be discovered after the work has started, the Contractor shall report such discrepancies or conflicts to the Architect immediately and no work affected thereby shall be started, or if started, shall be stopped immediately until the Contractor and the Architect agree upon clarification of the discrepancy or conflict.**

1.05 PERMITS, FEES AND NOTICES:

- A. Add the following Subparagraph 3.7.6 at the end of Paragraph 3.7, Permits, Fees, Notices, and Compliance with Laws:

3.7.6 The Contractor shall obtain a Certificate of Occupancy from the Building Inspection Department having jurisdiction for each phase of the project as it is completed and ready for occupancy and shall deliver such certificate to the Architect.

1.06 SUBMITTALS:

- A. Add the following Subparagraphs 3.12.11 and 3.12.12 at the end of Paragraph 3.12, Shop Drawings, Product Data and Samples:

3.12.11 Additional provisions pertaining to shop drawings and samples are included in Division 1, General Requirements.

**3.12.12 Submittals that have not been marked as reviewed, signed and dated by the Contractor may be returned by the Architect without action.**

1.07 SUBCONTRACTURAL RELATIONS:

- A. Add the following Subparagraphs 5.3.1 and 5.3.2 to Paragraph 5.3, Subcontractual Relations:

5.3.1 The Contractor shall be directly responsible for all of the work included in the Contract, whether performed by his own forces or by his subcontractors. Except in extreme emergencies, all instructions, clarifications, and approvals will be given by the Architect to subcontractors only through the Contractor and all shop drawings, samples, and correspondence from the subcontractor shall be submitted to the Architect through the Contractor.

5.3.2 Insofar as it does not affect the quality of workmanship or materials, the Contractor shall settle all questions of responsibility arising among his various subcontractors and shall determine the extent of work and responsibility of each of the subcontractors.

1.08 CHANGES IN THE WORK:

- A. Change Sub-subparagraph .5 of Subparagraph 7.3.4 to the following:

.5 Overhead and profit of which the maximum amount of allowable given in this Subparagraph shall be considered to include, but is not limited to, job-site staff and office expense, incidental job burdens, small tools, bonds, insurance and home office overhead allocation. The percentages for overhead and profit shall not exceed the following:

To Contractor on work performed by other than its own forces - 5% profit;

To first-tier Subcontractor on work performed by its Sub-subcontractors - 5% profit; and

To Contractor and/or Subcontractors for that portion of the work performed with their respective forces - 10% overhead and 5% profit.

- B. Add the following Subparagraph 7.4.1 to Paragraph 7.4, Minor Changes in the Work:

7.4.1 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials, and subcontractors. **Where major cost items are subcontracts, they shall be itemized also. In no case will a change involving over \$500.00 be approved without such itemization.**

1.09 APPLICATIONS FOR PAYMENT:

- A. Add the following Clauses 9.3.4 and 9.3.5, in Paragraph 9.3, Applications for Payment:

9.3.4 Until the work is fifty percent (50%) complete, the Owner will pay ninety percent (90%) of the amount due the Contractor on account of progress payments, provided, however, that the retainage amount may not exceed five percent (5%) of the amount of such Contract. At the time the work is fifty percent (50%) complete and thereafter, in the absence of other good and sufficient reasons, the Architect will, on presentation by the Contractor of Consent of Surety for each Application, authorize any remaining partial payments to be paid in full.

9.3.5 The Contractor is to use the 1992 Edition of AIA Document G702, Application and Certificate for Payment. **Beginning with the second Application for Payment, the Contractor shall verify that he has paid all subcontractors and major material suppliers those respective amounts representing all work and materials which have formed the basis of previous progress payments.** The application shall be submitted in three notarized copies.

1.10 PROGRESS PAYMENTS:

- A. Revise Subparagraph 9.6.1, to read as follows:

Unless otherwise provided in the agreement, the Owner will make progress payments to the Contractor on or about the fifteenth (15<sup>th</sup>) day of each calendar month on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month. In preparing estimates, materials delivered to and properly stored on the site shall be given consideration. **Materials stored off-site shall not be paid for by the Owner unless the Contractor furnishes a certificate of insurance for that material showing the Owner as the Owner of said material.**

- B. Add Subparagraph 9.6.9 at the end of Subparagraph 9.6, Progress Payments.

9.6.9 Upon commencement of the work, an escrow account as provided by Tennessee Code Annotated, Section 4-15-102; Section 66-11-144 and Title 66, Chapter 34, shall be established in a financial institution chosen by the Contractor and approved by the Owner. The escrow agreement shall provide that the financial institution will act as escrow agent, will pay interest on funds deposited in such account in accordance with provisions of the escrow agreement and will disburse funds from the account upon the direction of the Owner as set forth below. Compensation to the escrow agent for establishing and maintaining the escrow account shall be paid from interest accrued to the escrow account.

1.11 FINAL PAYMENT:

- A. In Subparagraph 9.10.2, item (6), delete the words "if required by the Owner"; and replace the words "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" with the following: "Contract Close Out Submittals as enumerated in Section 01 33 00 Submittals and as reviewed and approved by the Architect.

1.12 COSTS FOR DELAYS IN COMPLETION:

- A. Add the following Subparagraph 9.8.6 at the end of Paragraph 9.8, Substantial Completion:

9.8.6 As actual damages for any delay in completion are impossible of determination, the Contractor and his sureties shall be liable for and shall pay to the Owner the sum of Eight Hundred Dollars (\$800.00) as fixed, agreed, and liquidated damages for each calendar day of delay until a Certificate of Substantial Completion is executed by the Owner, Architect, and Contractor.

- B. Add the following Subparagraph 9.10.6 at the end of Paragraph 9.10, Final Completion and Final Payment:

9.10.6 If after Substantial Completion of the work and issuance of the Punch List, Final Completion of the Work is delayed beyond the time allotted for completion of the Punch List through no fault of the Owner or the Architect, the Contractor shall be liable for such ongoing costs as the Architect shall incur on the Project. Such costs shall be computed and billed to the Contractor at the Architect's standard hourly rates in effect at the time the work is executed. Payment shall be required within thirty (30) days of invoice. Interest shall accrue at one percent (1%) per month on past due amounts. Contractor shall be liable for all legal fees if legal action is required for collection of unpaid amounts.

1.13 CONTRACTOR'S LIABILITY INSURANCE:

- A. In Subparagraph 11.1.1 in the second line, following the phrase "in where the Project is located", insert the following clause: ", and to which the Owner has no reasonable objections,".

1.14 LIMITS OF CONTRACTOR'S LIABILITY INSURANCE:

Add the following Clause 11.1.2.1 to Subparagraph 11.1.2:

11.1.2.1 The insurance required by Subparagraph 11.1.1 shall be written for not less than the following limits, or greater if required by law:

A. Workmen's Compensation:

1. State: Statutory
2. Employer's Liability: \$100,000.00 Each Accident  
\$500,000.00 Disease - Policy Limit  
\$100,000.00 Disease - Each Employee

B. Comprehensive General Liability (including Premises-Operations; Independent Contractors' Products/Completed Operations; Contractual; Personal injury):

1. Bodily Injury & Property Damage, combined single limit:  
Each Occurrence: \$1,000,000.00  
Annual Aggregate: \$1,000,000.00
2. Products/Completed Operations to be Maintained for One Year After Final Payment.  
5,000,000.00 Aggregate
3. Property Damage Liability Insurance shall provide X, C, and U Coverage, and Coverage for any Special Hazards such as Blasting.

C. Comprehensive Automobile Liability (including Owned, Hired and Non-Owned):

1. Bodily Injury and Property Damage Combined: \$500,000

D. Umbrella Liability: \$2,000,000

1.15 OWNER'S INSURANCE:

- A. Replace Paragraph 11.2.1 with the following:

11.2. The Contractor shall take out and furnish to the Owner and maintain during the life of this Contract complete Owner's Protective Liability Insurance in amounts as specified in the limits of Contractor's Liability Insurance for Bodily Injury and Property Damage. This policy shall be made out in the name of the Owner and the Architect.

1.16 PROPERTY INSURANCE (BUILDER'S RISK)

- A. In Subparagraph 11.3.1, in the phrase: "Unless otherwise provided, the Owner", change the word "Owner" to "Contractor".
- B. Delete Subparagraph 11.3.1.2.

1.17 PROPERTY INSURANCE DEDUCTIBLES:

- A. Revise Subparagraph 11.2.1.1 to read as follows:

11.2.1.1 If by the terms of this insurance any mandatory deductibles are required, the Contractor shall be responsible for payment of the amount of the deductible in the event of a paid claim.

1.18 PERFORMANCE BOND AND PAYMENT BOND

- A. Change Subparagraph 11.1.2 to read as follows:

11.1.2 The Contractor shall execute a performance bond and a payment bond in an amount equal to one hundred percent (100%) of the Contract Sum and a payment bond covering and including labor and materials in an amount equal to one hundred percent (100%) of the Contract Sum. Bond shall be executed on AIA Document A311 and A312. Such bond shall be from a surety Company authorized to transact business in the State of Alabama and Company shall be registered in Federal Register, Department of the Treasury, Fiscal Service, Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies; Notice. Attorneys in Fact who sign any bonds must file with each instrument a certified and effective dated copy of their power of attorney.

- B. Add the following Subparagraph 11.1.2.1 to the end of Subparagraph 11.2.1:

11.1.2.1 Mechanical, Plumbing and Electrical Subcontractors shall execute a performance bond in an amount equal to one hundred percent of the Contract Value of their portion of the work and a payment bond covering and including labor and materials in an amount equal to one hundred percent (100%) of the Contract Value of their portion of the work. Performance and Labor and Material Payment Bonds shall be executed on AIA Form A311 and A312. Such bond shall be from a surety Company authorized to transact business in the State of Alabama and Company shall be registered in Federal Register, Department of the Treasury, Fiscal Service, Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies; Notice. Attorneys in Fact who sign any bonds must file with each instrument a certified and effective dated copy of their power of attorney.

1.19 INSPECTIONS AND CORRESPONDENCE:

- A. Add the following Subparagraph 13.5.7 to the end of Paragraph 13.5, Tests and Inspections:

13.5.7 Inspections and or correspondence by the Architect required due to failure by the Contractor to obtain inspections and approval from the Public Authorities having jurisdiction are beyond the scope of Construction Contract Administration for the Architect. As additional services, the Contractor will be billed a minimum fee of Five Hundred Dollars (\$500.00) per occurrence plus the Architect's time at the Architect's standard hourly rate for the personnel required to perform these functions.

1.20 INTEREST:

A. Revise Paragraph 13.6 to read as follows:

"Payments due and unpaid for thirty (30) days under the Contract Documents shall bear interest from the date thirty (30) days after payment is due at the rate of 1/2% (0.5 percent) per month.

1.21 TIME:

A. Time is an essential consideration of the Contract and work shall commence on the date to be specified in a written notice to the Contractor to proceed and shall progress with a proper and sufficient force of workmen and ample supply of materials and equipment to complete the Contract within the time limit agreed to in the Contract for Construction.

1.22 SUBSTITUTIONS:

A. All requests shall be submitted to the Architect in writing with a fully executed substitution request form and shall clearly define and describe materials, methods or equipment for which approval is requested.

B. Prior to Execution of a Contract for Construction:

1. If any Contractors desire to substitute any firms, materials, brands, methods, etc., other than specified, he may have the privilege at any time prior to ten days before bidding, of submitting these matters to the Architect for approval.
2. Requests shall be submitted by the General Contractor. Direct requests by manufacturer or material suppliers will not be considered.
3. If such submissions are approved by the Architect or if the Architect shall decide to enlarge the scope of the Specifications, such approvals or additional information will be made by Addendum to the Contractor.

C. After Execution of a Contract for Construction:

1. Substitutions after execution of a Contract for Construction will, generally, not be considered, except under unusual circumstances, such as strikes, lockouts, bankruptcy, discontinuing of a product, etc.
2. Requests for substitutions shall be made in writing to the Architect within ten (10) days of the date that the Contractor ascertains that he cannot obtain the material or equipment specified.
3. Requests shall be accompanied by complete description of the material or apparatus to be submitted. On request from the Architect, samples of any of all such items shall be submitted and/or set up as directed for inspection and consideration. The amount of credit or extra cost to the Owner on account of the substitution shall be a part of this request.
  - a. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - i. Statement indicating why specified material or product cannot be provided.
    - ii. The amount of credit or extra cost to the Owner on account of the substitution
    - iii. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and



separate contractors, that will be necessary to accommodate proposed substitution.

- iv. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
- v. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
- vi. Samples, where applicable or requested.
- vii. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
- viii. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
- ix. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
- x. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
- xi. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

D. "Or Equal", "Or Approved Equal" or "Or Approved Substitution"

- 1. The phrases "or equal", "or approved equal" or "approved substitution" are not applicable to this project. Disregard all occurrences in the Contract Documents. Where specific products and materials are enumerated, those products and materials alone are acceptable. Where performance criteria is provided, all criteria must be met.

1.23 STANDARDS:

- A. Any material or other work specified by reference to the number, symbol, or title of a specific standard, such as American National Standards Institute (ANSI) Standard, a Federal Specification, a trade association standard, or other similar standard, shall conform to the requirements in the latest revision thereof or any amendment or supplement thereto in effect on the date of the drawings and specifications, except as limited to type, class or grade, or as modified in such reference.
- B. The standards referred to, except as modified in the specification, shall have full force and effect as though recited for the reason that the manufacturers and trades involved are assumed to be familiar with their requirements. The Architect will furnish, upon request, information as to how copies of the standards referred to may be obtained.
- C. Where material or work is specified by reference to conform to standards such as listed in Paragraph A above, or to Codes, Laws, and Regulations, but specific provisions of the Contract

Drawings or Contract Specifications exceed the requirements of such references, the Contract Drawings and Specifications shall govern.

1.24 MANUFACTURER'S DIRECTIONS:

- A. All manufactured articles, material and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the manufacturer's instructions and recommendations. Any conflicts between such manufacturer's instructions and recommendations and the specifications shall be brought to the attention of the Architect and the procedures reconciled before proceeding with the work.

1.25 GUARANTEE:

- A. All work under this Contract shall be guaranteed for a period of one (1) year after execution of Certificate of Substantial Completion against defects caused by the use of inferior materials or workmanship. Guarantee period of incomplete items at time of execution of Certificate of Substantial Completion shall commence on date of installation into building. Repair and/or replace all such defective materials or equipment and any work damaged thereby or make any other adjustment necessary without additional cost to the Owner.

1.26 LAYING OUT WORK:

- A. The Contractor shall, immediately upon entering the projects for the purpose of beginning work, locate all general reference points and be responsible for all lines, elevations, and measurements.

2PART II PRODUCTS:

NOT USED

3PART III EXECUTION:

NOT USED

End of Section

# Supplementary Conditions of the Contract for Construction

U.S. Department of Housing  
and Urban Development  
Office of Housing  
Federal Housing Commissioner

OMB Approval No. 2502-0470  
(Expires 12/31/2016)

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. This information is required to obtain benefits and voluntary. HUD may not collect this information, and you are not required to complete this form, unless it displays a currently valid OMB control number.

This information collection is necessary to ensure that viable projects are developed. It is important to obtain information from applicants to assist HUD in determining if nonprofit organizations initially funded continue to have the financial and administrative capacity needed to develop a project and that the project design meets the needs of the residents. The Department will use this information to set forth the obligations of the contractor or subcontractor performing under the covered contract. This information is required in order to obtain benefits. This information is considered non-sensitive and no assurance of confidentiality is provided.

## Article 1 – Labor Standards

### Instructions

Whenever only FHA mortgage insurance is involved, use paragraph (A) and (C) of Article 1 – Labor Standards. Whenever any direct form of assistance (Section 8, Section 202/811 Capital Advance, grants etc.) is involved, use paragraphs (A) and (B) and (C) of Article 1 – Labor Standards.

### Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted or insured by the United States of America and the following Federal Labor Standards Provisions are included in this Contract or related instrument pursuant to the provisions applicable to such Federal assistance or insurance.

**A. 1. (i) Minimum Wages.** All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR Part 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

**(ii) (a)** Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

**(1)** The work to be performed by the classification

requested is not performed by a classification in the wage determination; and

**(2)** The classification is utilized in the area by the construction industry; and

**(3)** The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

**(b)** If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

**(c)** In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

**(d)** The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs A.1.(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

**(iii)** Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

**(iv)** If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

**2. Withholding.** HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the

same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

**3. (i) Payrolls and basic records.** Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and budget under OMB Control Numbers 1215-0140 and 1215-0017.)

**(ii) (a)** The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR Part 5.5(a)(3)(i). This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

**(b)** Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

- (1)** That the payroll for the payroll period contains the information required to be maintained under 29 CFR Part 5.5(a)(3)(i) and that such information is correct and complete;
- (2)** That each laborer or mechanic (including each

helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

**(3)** That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

**(c)** The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph A.3.(ii)(b) of this section.

**(d)** The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

**(iii)** The contractor or subcontractor shall make the records required under paragraph A.3.(i) of this section available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR Part 5.12.

**4. (i) Apprentices and Trainees. Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau

of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) **Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman's hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) **Equal employment opportunity.** The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

**5. Compliance with Copeland Act Requirements.** The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract.

**6. Subcontracts.** The contractor or subcontractor will insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as HUD or its designee may be appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.

**7. Contract termination; debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**8. Compliance with Davis-Bacon and Related Act Requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

**9. Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

**10. (i) Certification of Eligibility.** By entering into this contract the contractor certifies neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm

ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1010, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration . . . makes, utters or publishes any statement, knowing the same to be false . . . shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

**B. Contract Work Hours and Safety Standards Act.** As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

**1. Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

**2. Violation; liability for unpaid wages, liquidated damages.** In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.

**3. Withholding for unpaid wages and liquidated damages.** HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

**4. Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

**C.** The Contractor will be required to execute FHA Form No. 2403-A, Contractor's Prevailing Wage Certificate, as a condition precedent to insurance by the Federal Housing Administration of that certain mortgage loan, or an advance thereof, made or to be made by the mortgagee in connection with the construction of the project.

## **Article 2 – Equal Employment Opportunity**

The applicant hereby agrees that it will incorporate or cause to be

incorporated into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 CFR Chapter 60, which is paid for in whole or in part with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to a grant, contract, loan insurance, or guarantee, or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance, or guarantee, the following equal opportunity clause:

During the performance of this contract, the Contractor agrees as follows:

**A.** The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided setting forth the provisions of this nondiscrimination clause.

**B.** The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

**C.** The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding a notice to be provided advising the said labor union or workers representatives of the Contractor's commitments hereunder, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

**D.** The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965 and of the rules, regulations, and relevant orders of the Secretary of Labor.

**E.** The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

**F.** In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulations or order of the Secretary of Labor, or as otherwise provided by law.

**G.** The Contractor will include the portion of the sentence immediately preceding paragraph A and the provisions of paragraphs A through G in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Secretary of Housing and Urban Development or the Secretary of Labor may direct as a means of enforcing such provisions, including sanctions for noncompliance. *Provided, however,* that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Secretary of Housing and Urban Development or the Secretary of Labor, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

**H.** The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work:

*Provided, That* if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

**I.** The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

**J.** The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

### **Article 3 – Equal Opportunity for Businesses and Lower Income Persons Located Within the Project Area**

(Applicable to Section 236 projects, where the estimated replacement cost of the project as determined by the Secretary of Housing and Urban Development exceeds \$500,000, and to all projects, including Section 236 regardless of estimated replacement cost, receiving rent supplement assistance under Title I, Section 101 of the Housing and Urban Development Act of 1965.)

**A.** The work to be performed under this contract is on a project assisted under a program providing direct Federal financial assistance from the Department of Housing and Urban Development and is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u. Section 3 requires that to the greatest extent feasible opportunities for training and employment be given lower income residents of the unit of local government or the metropolitan area (or nonmetropolitan county) as determined by the Secretary of Housing and Urban Development in which the projects located and contracts for work in connection with the project be awarded to business concerns which are located in, or owned in substantial part by persons residing in the same metropolitan area (or nonmetropolitan county) as the project.

### **Article 4 – Health and Safety**

**A.** No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

**B.** The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 (formerly part 1518) and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96).

**C.** The Contractor shall include the provisions of this Article in every subcontract so that such provisions will be binding on each subcontractor. The Contractor shall take such action with respect to any subcontract as the Secretary of Housing and Urban Development of the Secretary of Labor shall direct as a means of enforcing such provisions.



#### SECTION 00 73 46 – WAGE RATE DETERMINATION

The Contractor is required to pay the prevailing wage scale current in the area of the project to all laborers in the area of the project to all laborers and mechanics employed in the Work in accordance with the Paragraph 27 of the General Conditions.

The following paragraphs are excerpted from the Federal Register, Vol. 54, No. 244 (December 21, 1989), Rules and Regulations, and are applicable to this project:

- (1) Any solicitation of bids or proposals issued by the PHA and any contract executed by the PHA for modernization of the project shall include a statement that any prevailing wage rate (including basic hourly rate and any fringe benefits) determined under State or tribal law to be prevailing with respect to an employee in any trade or position employed under the contract is inapplicable to the contract and shall not be enforced against the Contractor or any subcontractor with respect to employees engaged under the contract whenever either of the following occurs:
  - (i) Such nonfederal prevailing wage rate exceeds:
    - (A) The applicable wage rate determined by the Secretary of Labor pursuant to the Davis-Bacon Act (40 U.S.C. 276a et seq.) to be prevailing in the locality with respect to such trade;
    - (B) An applicable apprentice wage rate based thereon specified in an apprenticeship program registered with the Department of Labor or a DOL-recognized State Apprenticeship Agency; or
    - (C) An applicable trainee wage rate based thereon specified in a DOL-certified trainee program; or
  - (ii) Such nonfederal prevailing wage rate, exclusive of any fringe benefits, exceeds the applicable wage rate determined by the Secretary of HUD to be prevailing in the locality with respect to such trade or position.

The current wage rate determination for this project is included in the following page(s).

General Decision Number: FL190082 01/04/2019 FL82

Superseded General Decision Number: FL20180125

State: Florida

Construction Type: Residential

County: Polk County in Florida.

RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date
0	01/04/2019

ENGI0925-008 06/01/2013

Rates	Fringes
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POWER EQUIPMENT OPERATOR:

Crawler Cranes; Truck	
Cranes; Pile Driver	
Cranes; Rough Terrain	
Cranes; and Any Crane not	
otherwise described below...	\$ 29.61
Hydraulic Cranes Rated 100	11.50
Tons or Above but Less	
Than 250 Tons; and Lattice	
Boom Cranes Less Than 150	
Tons if not described below.	\$ 30.61
Lattice Boom Cranes Rated	11.50
at 150 Tons or Above;	
Friction Cranes of Any	
Size; Mobile Tower Cranes	
or Luffing Boom Cranes of	

Any Size; Electric Tower  
Cranes; Hydraulic Cranes  
Rated at 250 Tons or  
Above; and Any Crane  
Equipped with 300 Foot or  
More of Any Boom  
Combination.....\$ 31.61 11.50  
Oiler.....\$ 22.91 11.50

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\* IRON0397-003 07/01/2018

	Rates	Fringes
IRONWORKER, REINFORCING AND STRUCTURAL.....	\$ 29.85	15.97

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SUFL2009-121 06/08/2009

	Rates	Fringes
BRICKLAYER.....	\$ 20.00	0.00
CARPENTER, Includes Cabinet Installation.....	\$ 11.37	0.00
CEMENT MASON/CONCRETE FINISHER...	\$ 15.14	0.00
ELECTRICIAN.....	\$ 12.66	0.00
IRONWORKER, ORNAMENTAL.....	\$ 12.60	0.00
LABORER: Common or General.....	\$ 9.85	0.00
LABORER: Mason Tender - Brick...	\$ 11.51	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 10.46	0.00
LABORER: Pipelayer.....	\$ 11.79	0.00
LABORER: Roof Tearoff.....	\$ 9.00	0.00
LABORER: Landscape and Irrigation.....	\$ 8.26	0.00
OPERATOR: Asphalt Paver.....	\$ 12.07	0.00
OPERATOR: Backhoe Loader Combo.....	\$ 17.04	0.00
OPERATOR: Backhoe/Excavator.....	\$ 12.56	0.00
OPERATOR: Bulldozer.....	\$ 12.14	0.00
OPERATOR: Distributor.....	\$ 11.57	0.00
OPERATOR: Forklift.....	\$ 17.38	0.00
OPERATOR: Grader/Blade.....	\$ 15.50	0.00
OPERATOR: Loader.....	\$ 11.59	0.00
OPERATOR: Roller.....	\$ 11.02	0.00
OPERATOR: Screed.....	\$ 11.08	0.00

OPERATOR: Trackhoe.....	\$ 15.68	0.00
OPERATOR: Tractor.....	\$ 10.20	0.00
PLUMBER.....	\$ 13.22	0.00
ROOFER, Includes Built Up, Modified Bitumen, and Shake & Shingle Roofs (Excludes Metal Roofs).....	\$ 13.33	0.00
ROOFER: Metal Roof.....	\$ 16.99	0.00
SHEET METAL WORKER, Excludes Metal Roof Installation.....	\$ 9.50	0.00
TRUCK DRIVER, Includes Dump Truck.....	\$ 10.22	0.00
TRUCK DRIVER: Lowboy Truck.....	\$ 12.10	0.00

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION



## SECTION 01 10 00 - SUMMARY OF THE WORK

### PART I GENERAL

#### 1.01 WORK INCLUDED:

- A. Furnish all labor, materials and equipment, and perform all work to construct, as specified herein and "A New Development for: Westwood at Winterhaven Apartments, Avenue "G" N.W., Winter Haven, FL 33881, HUD #067-35554" shown on the accompanying drawings. The building shall be constructed complete and ready for occupancy except for the items specifically excluded in "Work Not Included".
- B. The work shall include; building construction, plumbing, heating, ventilating and air conditioning; electrical work; special equipment as specified; and furnishings as shown and specified.
- C. Patch any existing work damaged by construction.

#### 1.02 WORK NOT INCLUDED:

- A. The following items of work will be provided by the Owner or by others under separate contracts:
  - 1. Movable furniture unless specifically shown on the drawings and specifications.
  - 2. Security System Equipment.
  - 3. Telephone System Equipment.
  - 4. Computer System Equipment.
  - 5. Any other items noted on the drawings as "N.I.C." or "Not In Contract".
- B. The following work in connection with the items listed in paragraph 1.02A preceding shall be part of the General Contract work:
  - 1. Verification of correct location of electrical receptacles, telephone outlets, water and waste connections and similar outlets to suit equipment arrangement.
  - 2. Provision of telephone outlet boxes and conduit turned out above ceiling for use by owner's telephone contractor.

#### 1.03 OCCUPANCY OF THE BUILDING DURING CONSTRUCTION:

- A. The Contractor shall schedule and organize his work in such a manner and use such methods that will interfere as little as possible with other work in progress on the site and with the operation of adjacent buildings.

#### 1.04 CONTRACTOR'S USE OF PREMISES:

- A. Before construction is started the Contractor shall confer with the Architect and the Owner and arrange for available trucking and storage space for the delivery of materials, storage space for materials and equipment, and parking space for his workmen.
- B. Construction operations and storage of materials and equipment shall be restricted to areas of the site mutually agreed upon and in such a manner as not to block access of fire fighting equipment to the building and facilities.

- C. Construction vehicular traffic and the operation of construction equipment such as cranes, bulldozers, and other similar equipment shall be carefully supervised and controlled to avoid damage to existing structures and facilities which are to remain in place.

1.05 VERIFICATION OF DIMENSIONS:

- A. Dimensions, elevations, and locations shown on the drawings in reference to existing structures and utilities are the best available data obtainable but are not guaranteed by the Architect or the Owner and the Architect and the Owner will not be responsible for their accuracy.
- B. Before proceeding with any work dependent upon the data involved, the Contractor shall field check and verify all dimensions, grades, line levels, or other conditions of limitations at the site and building to avoid construction errors. If any work is performed by the Contractor or by his Subcontractors prior to adequate verification of applicable data, any resultant extra cost for adjustment of work to conform to existing limitations shall be borne by the Contractor without reimbursement or compensation by the Owner.

1.06 CONTROL POINTS AND LAYOUT:

- A. The initial lines, grades, and dimensions necessary for the location and control of the work under the Contract are shown on the Contract Drawings.
- B. The Contractor shall provide for himself all additional and supplementary lines and grades as may be necessary to layout the work and insure proper control of the work until completed. It shall be the Contractor's responsibility to satisfy himself as to the accuracy of all measurements before construction.

1.07 SUBSTANTIAL COMPLETION OF THE WORK:

- A. Upon substantial completion of any phase of the work, the Owner shall assume complete responsibility for the maintenance and operation of the heating, ventilating and air conditioning system and service utilities in that portion of the project.
- B. The Owner shall also become responsible for all other maintenance and damage and ordinary wear and tear and, with the exception of items under guarantee, the cost of repairs or restoration during the period between substantial and final completion.
- C. The Owner shall have the responsibility to have in effect all necessary insurance for protection against any losses not directly attributable to the Contractor's negligence.
- D. Upon substantial completion, payments for work in the substantially complete portion of the work shall be released to the Contractor, except for the retainage and an amount to cover the cost of the incomplete or deficient items included in the punch list made at the inspection to determine substantial completion. This amount shall be approximately the value of the punch list items as estimated by the Architect.
- E. The Contractor shall arrange a schedule so that punch list items are completed in the designated time by working during regular working hours. The Contractor shall be afforded access to the occupied portion of the building to perform this work during regular working hours.

1.08 ENVIRONMENTAL HAZARDOUS PRODUCTS, MATERIALS, WASTE:

- A. Do not incorporate in the Work hazardous materials or products as currently defined in the Resource Conservation and Recovery Act of 1976 (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or Environmental Protection Agency (EPA) regulations, rules, or requirements, as amended, unless the Contract Documents

give no other option than to provide a material or product which contains a hazardous material, component, constituent, waste, or leachate. In studying the Contract Documents and carrying out the Work, report at once to the Designer the discovery of a product or material which contains hazardous materials, components, constituents, waste, or leachate.

- B. Do not incorporate in the Work a product or material which contains concentrations of a constituent, component, or material above the threshold levels which would require adherence to hazardous waste disposal regulations as currently defined, or could cause a release or threat of release of a hazardous substance at a level that would require a remedial response or removal action as currently defined by RCRA, CERCLA, or the EPA.
- C. Select materials and products meeting specified requirements which comply with EPA requirements as regards hazardous materials content. In making requests for substitutions, determine that materials and products proposed for substitution comply with RCRA, CERCLA, and EPA requirements.

1.09 BUILDING PRODUCTS USE:

- A. It is the responsibility of the Contractor to inform himself concerning the application of the products he uses to follow the directions of the Architect and manufacturer.
- B. In the event of disagreement between the Contract Documents and the manufacturer's directions, the Contractor will obtain written instructions from the Architect before proceeding with the installation.
- C. If the Contractor has knowledge of or reason to believe the likelihood of failure, he will transmit such knowledge to the Architect, and ask for written instructions before proceeding with the work.

1.10 OWNERSHIP OF REMOVED MATERIALS AND EQUIPMENT:

- A. All removed existing materials and equipment designated to be removed which are not to remain the property of the Owner or are not noted to be reused in the new work shall become the property of the Contractor and shall be removed from the premises and site and disposed of by him.

1.11 SEPARATE CONTRACTS: NOT APPLICABLE

PART II PRODUCTS

NOT USED

PART III EXECUTION

NOT USED

End of Section

## SECTION 01 16 00 - REGULATORY REQUIREMENTS

### PART I GENERAL

#### 1.01 GENERAL:

- A. Where codes and standards are referenced in this and other sections of the specifications or on the drawings, whether or not a particular edition is referenced, it is the intention that these be the latest editions as adopted by the governing agency under whose jurisdiction the project is to be constructed. The latest edition shall be the edition in effect on the date approval is granted for construction to begin.

#### 1.02 CODES:

- A. Work shall conform to the requirements of the building code indicated on the drawings. If no code is listed, work shall conform to the requirements of the building code in effect for the jurisdiction having authority.
- B. Work shall conform to the requirements of the life safety code indicated on the drawings. If no code is listed, work shall conform to the requirements of the life safety code in effect for the jurisdiction having authority.
- C. Plumbing and gas piping work shall conform to the requirements of the plumbing and gas codes indicated on the drawings. If no code is listed, work shall conform to the requirements of the plumbing and gas codes in effect for the jurisdiction having authority.
- D. Work shall conform to the requirements of the electrical code indicated on the drawings. If no code is listed, work shall conform to the requirements of the electrical code in effect for the jurisdiction having authority.
- E. Work shall conform to the requirements of the latest edition of ICC/ANSI A117.1 Standard on Accessible and Usable Buildings and Facilities.
- F. Work shall conform to the requirements of the latest edition of Americans with Disabilities Act (ADA).

#### 1.03 CODE STANDARDS:

- A. Fire doors shall conform to requirements of NFPA No. 80, Standards for Fire Doors and Windows.
- B. Heating, ventilating and air conditioning work shall conform to requirements of NFPA NO. 90A, Standard for the Installation of Air Conditioning and Ventilating Systems.

#### 1.04 REGULATIONS:

- A. Electrical work shall conform to applicable regulations of the State, Department of Insurance, Division of Fire Prevention and to applicable regulations of the Local Utility Company.
- B. Work shall be performed in a manner approved by the Occupational Safety and Health Administration. The Contractor shall be responsible for job-site safety and training of workman as required by Occupational Safety and Health Administration.

#### 1.05 MATERIAL AND TESTING STANDARDS:

- A. Components of the work shall conform to requirements of American Society for Testing and Materials (ASTM) Standards, American National Standards Institute (ANSI) standards, and Trade Association Standards, as listed in the various other sections of the specifications.

1.06 MANUFACTURER'S RECOMMENDATIONS:

- A. When work in accordance with manufacturer's recommendations is specified, a copy of those recommendations shall be kept in the job office.

1.07 STORM WATER DISCHARGE PERMIT:

- A. If Construction Operations will disturb the ground, the Contractor must file a "Notice of Intent" for and obtain a National Pollutant Discharge Elimination System Permit from:

Stormwater NOI Processing  
Division of Water Pollution Control  
401 Church Street  
Department of Environment and Conservation  
Nashville, Tennessee 37243-1534

- B. Any fines levied because of the Contractor's failure to obtain the necessary permit will be the responsibility of the Contractor.

PART II PRODUCTS - NOT USED

PART III EXECUTION - NOT USED

End of Section

## SECTION 01 25 00 – SUBSTITUTION PROCEDURES

### 1PART I GENERAL

#### 1.01 GENERAL:

- A This Section includes administrative and procedural requirements for submittal and approval of substitutions.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and other Division 1, General Requirements, apply to the work under this section.

#### 1.03 DEFINITIONS:

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
  2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

#### 1.04 SUBMITTALS:

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use facsimile of form provided in the Project Manual.
  2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
      - i. Operational efficiency and energy consumption for equipment and appliances.
    - e. Samples, where applicable or requested.



- f. Certificates and qualification data, where applicable or requested.
  - g. List of similar installations if requested, for completed projects with project names and addresses and names and addresses of architects and owners.
  - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - i. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - j. Cost information, including a proposal of change, if any, in the Contract Sum.
  - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
  - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

#### 1.05 QUALITY ASSURANCE:

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

#### 1.06 PROCEDURES:

- A. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.

### PART 2 PRODUCTS

#### 2.01 SUBSTITUTIONS:

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than fifteen (15) days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
  - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - b. Substitution request is fully documented and properly submitted.
  - c. Requested substitution will not adversely affect Contractor's construction schedule.
  - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - e. Requested substitution is compatible with other portions of the Work.
  - f. Requested substitution has been coordinated with other portions of the Work.
  - g. Requested substitution provides specified warranty.
  - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 10 days prior to the date of the Bid. Requests received after that time may be considered or rejected at discretion of Architect.
  1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
    - b. Requested substitution does not require extensive revisions to the Contract Documents.
    - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - d. Substitution request is fully documented and properly submitted.
    - e. Requested substitution will not adversely affect Contractor's construction schedule.
    - f. Requested substitution has received necessary approvals of authorities having jurisdiction if applicable.
    - g. Requested substitution is compatible with other portions of the Work.
    - h. Requested substitution has been coordinated with other portions of the Work.
    - i. Requested substitution provides specified warranty.

- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 EXECUTION - NOT USED

End of Section

## SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION:

### PART I GENERAL

#### 1.01 COORDINATION OF WORK OF SUBCONTRACTORS:

- A. It is the responsibility of the Contractor to coordinate the work of his mechanical and electrical subcontractors. To this end the Contractor shall require that the mechanical and electrical subcontractors examine and familiarize themselves with the architectural and structural drawings as well as the mechanical and electrical drawings and that they frequently consult with each other and all other trades so that the work can be properly coordinated.
- B. The Contractor shall carefully check the work of his subcontractor in order to deliver to the Owner the contract work complete and properly installed in conformance with the Contract requirements.

#### 1.02 CUTTING AND PATCHING:

- A. Cut and patch existing work that is to remain in place as necessary for the installation of new work.
- B. **It is the intention of the Contract that conduit, sleeves, thimbles, and chases for the mechanical and electrical work be installed in new concrete, masonry or stud wall work as the work progresses.** The mechanical and electrical subcontractors shall respectively install the required conduit, sleeves and thimbles in concrete forms and in masonry work and shall inform the Contractor of the size and location of any required chases to be formed in the concrete and masonry work. If this procedure is not followed, the mechanical and electrical subcontractors shall do all cutting of new concrete and masonry work required to install their work.
- C. Cutting of new work shall be held to the minimum necessary and shall be done neatly. The Contractor shall be responsible for the proper patching and finishing of all cut work whether or not cut by his own workmen or by subcontractors.
- D. Furr out walls or ceilings where necessary for the new work. Thicken walls as required to accommodate wall-mounted equipment including but not limited to electrical panel boxes, fire extinguisher cabinets, communications, security system, and fire alarm panels. Consult with the Architect about any furr outs not shown on the drawings to keep furr outs to a minimum.

#### 1.03 PROJECT COORDINATION:

- A. Large Equipment: When possible, equipment which is to be installed in the building that may be too large to pass through doorways, shafts, or other restrictions shall be brought on the job and placed in the proper location before the enclosing structure is completed, otherwise, arrange with other Contractors to permit access at a later date, at no additional cost to the Owner.

### PART II PRODUCTS

NOT USED

### PART III EXECUTION

NOT USED

End of Section

## SECTION 01 32 50 – WEATHER DELAYS

### PART I GENERAL

#### 1.01 DESCRIPTION:

- A. Work Included: Prepare and submit request for extensions of Time based on weather conditions.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not limited to General Conditions, Supplementary General Conditions and Sections in Division 1 of these Specifications.
  - 2. Applications for Payment.

#### 1.02 EXTENSIONS OF CONTRACT TIME:

- A. If the basis exists for an extension of Time in accordance with Article 8, Paragraph 8.3 of the General Conditions and Supplementary General Conditions, an extension of time on the basis of weather may be granted only for the number of Weather Delay Days in excess of the number of days listed in the standard Baseline for that month.
- B. Any and all submissions requesting time extensions by change order are subject to approval by HUD and the lender.

#### 1.03 STANDARD BASELINE FOR AVERAGE CLIMATIC RANGE:

- A. The State of Florida has reviewed weather data available from the National Oceanic and Atmospheric Administration and determined a Standard Baseline of average climatic range for the State of Florida.
- B. Standard Baseline shall be regarded as the normal and anticipatable number of calendar days for each month during which construction activity shall be expected to be prevented and suspended by cause of adverse weather. Suspension of construction activity for the number of days each month as listed in the Standard Baseline is included in the Work and is not eligible for extension of Contract Time.
- C. Standard Baseline for each month of the year is as follows (the anticipatable delay days follow the month):

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	11	8	7	7	6	7	5	4	5	6	11

#### 1.04 ADVERSE WEATHER AND WEATHER DELAY DAYS:

- A. Adverse Weather is defined as the occurrence of one or more of the following conditions, substantiated by NOAA data, which prevents exterior construction activity or access to the site within twenty four (24) hours:
  - 1. Precipitation threshold (rain, snow, or ice) in excess of one-tenth inch (0.10") liquid measure. Snow to liquid measure ratio is 10:1.
  - 2. Standing snow in excess of one inch (1.00").
- B. Additional extension of Time may be granted for drying days following periods of two or more consecutive days of precipitation for the following conditions:

1. At a rate of one day extension of Time for each period of two or more consecutive days of precipitation of 1.0 inch or more (liquid measure).
  2. Only if there is a hindrance to site access or site work, such as excavation, backfill and footings and the like and then only when no such work is performed.
- C. A Weather Delay Day may be counted only if adverse weather prevents work on the Project for fifty percent (50%) or more of the contractor's scheduled, critical path work, including a weekend day or holiday if Contractor has scheduled construction activity that day.

1.05 DOCUMENTATION AND SUBMITTALS:

- A. Contractor shall submit on a monthly basis daily job site work logs (daily reports) showing which, and to what extent, construction activities have been adversely affected by weather.
- B. Submit actual weather data, if requested by Architect to support claim for time extension, as obtained from NOAA weather reporting station in Sebring.
- C. Use Standard Baseline data provided in this Section when documenting actual delays due to weather in excess of the average climatic range.
- D. Organize claim and documentation to facilitate evaluation of a basis of calendar month periods, and submit in accordance with the procedures for Claims established in Paragraph 4.3 of the General Conditions.
- E. Extensions of Time requested by the Contractor and approved by the Architect on the basis of conditions stated above shall be acknowledged and communicated in writing to the Contractor periodically.
- F. For extensions of Contract Time granted, a modification shall be issued in accordance with the provisions of Article 7 of the General Conditions, and the applicable General requirements. Modifications for extensions of Time may be issued quarterly or held to the end of the Project as appropriate based on Architect's approval of such extensions as noted in E above.
- G. Extensions of Time not requested in a timely manner by the Contractor will not be granted at a later time.

PART II PRODUCTS

NOT USED

PART III EXECUTION

NOT USED

End of Section

## SECTION 01 33 00 – SUBMITTALS

### PART 1 GENERAL

#### 1.01 GENERAL:

##### A. Work Included:

1. Wherever possible, throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined either by manufacturer's name and catalog number or by reference to recognized industry standards.
2. To ensure that the specified products are furnished and installed in accordance with the design intent, procedures have been established for advance submittal of design data and for its review or rejection by the Architect.
3. Shop drawings, product data and samples will be required for items listed hereinafter in the various sections of the specifications. The Architect reserves the right to request samples of proposed substitutions for materials or equipment specified whether or not samples of the materials and equipment specified are called for.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

#### 1.03 DESCRIPTION OF REQUIREMENTS:

- A. The types of submittals controlled by these General Requirements include shop drawings, product data, samples and miscellaneous work-related submittals. The individual submittal requirements are specified in applicable section for each unit of Work.
- B. Definitions: the work-related submittals of this section, in addition to the definitions of the General Conditions and elsewhere in the Contract Documents for the requirements of administrative submittals.
1. **Shop drawings** include custom-prepared data of all forms including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements, and similar information not in standard printed form applicable to other projects.
  2. **Product data** includes standard printed information on materials, products and systems, not custom-prepared for this project, other than the designation of selections from available choices.
  3. **Samples** include both fabricated and unfabricated physical samples of materials, products and Work; both as complete units and as smaller portions of units of Work; either for limited visual inspection or (where indicated) for more detailed testing and analysis.
  4. **Miscellaneous submittals** related directly to the Work (non-administrative) include warranties, guarantees, maintenance agreements, workmanship bonds, quality testing and certifying reports, copies of industry standards, record drawings, operating and maintenance materials, overrun stock, security/protection/safety keys and similar information, devices and materials applicable to the Work and not defined as shop drawings, product data or samples.

#### 1.04 GENERAL SUBMITTAL REQUIREMENTS:

- A. Coordination and Sequencing: Coordinate the preparation and processing of submittals with the performance of the Work so that Work will not be delayed by submittals. Coordinate and sequence different categories of submittals for the same Work, and for interfacing units of Work,



so that one will not be delayed for coordination with another. Do not proceed with purchasing, fabrication and delivery of work related to a submittal until submittal procedure has been successfully completed.

- B. Preparation of Submittals: provide permanent marking on each submittal to identify it by project, date, Contractor, subcontractor, submittal name and similar information to distinguish it from other submittals. Show Contractor's approval marking prior to Architect's design intent review. Package each submittal appropriately for transmittal and handling. Submittals which are received directly from sources other than through the Contractor's office will be returned "without action".
- C. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Architect's approval of submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submission and the Architect has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for error or omissions in the submittals by the Architect's approval thereof.
- D. Verbal discussion between the Contractor and the Owner or the Architect of a proposed deviation and any subsequent agreements thereto shall not be considered valid unless confirmed in writing by the Owner or the Architect.
- E. The Contractor shall direct specific attention, in writing or on resubmitted submittals, to revisions other than those requested by the Architect on previous submittals.
- F. Delivery: All submittals shall be accompanied by a letter of transmittal containing an enumeration and description of the submittals and, unless otherwise specified, shall be delivered to the Architect. **The transmittal letter shall indicate whether the submittal is for a product as specified; is a pre-approved substitution; or is a request for substitution offered with supporting documentation in accordance with the Contract Documents.**

Unless directed otherwise, all submittals shall be delivered to:

Michael Scott  
MBI Companies Inc.  
299 N. Weisgarber Road  
Knoxville, Tennessee 37919-4013

1.05 SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS LIST:

- A. Within 30 days of receipt of a notice to proceed and prior to submitting any shop drawings or requests for payment, the Contractor shall submit a list of Subcontractors and Major Material Suppliers on the form provided in this Project Manual. The form shall list all Subcontractors and suppliers for the project providing material and or labor whose dollar value equals or exceeds Five Thousand dollars (\$5,000).

1.06 SCHEDULE OF VALUES:

- A. The schedule of values specified in Subparagraph 9.2.1 of the General Conditions shall be divided into not less than one-line item for each section of the specifications (except Division 1 sections). Coordinate line items in the schedule of values with portions of the contract documents which identify units or subdivisions of work. Specifically, correlate with the project manual table of contents. Divide major subcontracts into individual cost items. Submit Schedule of Values within 20 days after execution of the Contract.
  - 1. Where applications for payment are likely to include products purchased or fabricated but not yet installed, provide individual line items for material cost, installation cost, and other applicable phases of completion.
  - 2. Provide separate line items for each allowance included in the Contract price.

1.07 APPLICATIONS FOR PAYMENTS:

- A. Applications for payments shall be submitted on AIA Document G702, Application and Certificate for Payment, supported by AIA Document G702A, continuation sheet, and by separate lists of materials stored at the site and materials stored off the site. Three (3) original notarized copies of Applications for Payment shall be submitted.

1.08 CONTRACTORS PROGRESS SCHEDULE:

- A. Prepare a fully developed, horizontal bar-chart type, contractor's progress schedule. Submit within twenty (20) days after the date established for Commencement of the Work.
- B. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the work as indicated in the Schedule of Values.
- C. As work progresses, place a contrasting mark in each bar to indicate Actual Completion.
- D. Prepare the schedule on a sheet or series of sheets, of paper of sufficient width to show data for the entire construction period.
- E. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
- F. Coordinate the Contractor's Progress Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.
- G. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.
- H. Revise the schedule monthly. Issue the updated schedule concurrently with the Application and Certification for Payment.

1.09 REVIEW OF DELEGATED ENGINEERING DOCUMENTS:

- A. Delegated Engineer: A professional engineer who undertakes a specialty service and provides services or creative work regarding a portion of the engineering project such as a fabricator or contractor so long as the engineer acts as an independent consultant or through a duly qualified engineering corporation. The delegated engineer is the engineer of record for that portion of the project.
- B. Documents prepared by a delegated engineer shall bear the name and business address of the delegated engineer on the engineering documents. When such documents are issued for preliminary or conceptual use, the engineer shall clearly note the intended purpose of such documents.
- C. Documents prepared by the delegated engineer shall be submitted to the engineer of record for review for compliance with engineering requirements and to confirm the following:
  - 1. That the delegated engineering documents have been prepared by an engineer licensed and registered in the state of project construction.
  - 2. That the delegated engineering documents of the delegated engineer conform with the intent of the engineer of record and meet the written criteria.
  - 3. That the effect of the delegated engineer's work on the overall project generally conforms with the intent of the engineer of record.

1.10 SHOP DRAWINGS:

- A. General: See Paragraph 3.12 of the General Conditions for provisions pertaining to shop drawings.
- B. Preparation of Shop Drawings: Submit newly prepared information drawn accurately to scale sufficiently large to show all pertinent features of the item and its method of connection to the Work. **Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings.** Standard information prepared without specific reference to the Project is not a Shop Drawing. **Provide a space approximately 4 inches by 5 inches on the label or beside the title block on Shop Drawings to record the Architect's approval markings and recording action taken. Do not allow shop drawing copies without appropriate final review markings by the Architect or Engineer to be used in connection with the Work.**
- C. Identification: All submittals shall be clearly identified with the **name of the project, the supplier's name, the Contractor's name, and the location of material or equipment in the building. All shop drawings shall be dated and numbered.**
- D. Contractor's Review: Shop drawings submitted without evidence that they have been reviewed by the Contractor, as specified in Paragraph 3.12 of the General Conditions, or without proper identification as specified herein, will be returned to the Contractor without action by the Architect and shall be properly resubmitted. **When the phrase "by others" appears on a shop drawing, the Contractor shall indicate on the shop drawing who is to furnish the material or operation so noted, before submitting the drawing. By approving and submitting submittals, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.**
- E. Coordination of Submittals: Prior to submittal for Architect's review, use all means necessary to fully coordinate all material, including, but not limited to, the following procedures:
1. Determine and verify all field dimensions and conditions, catalog numbers, and similar data.
  2. Coordinate as required with all Trades and with all public agencies involved.
  3. Secure all necessary approval from public agencies and others; signify by stamp or other means that all required approvals have been obtained.
  4. Clearly indicate, in writing, all deviations from the Contract Documents.  
Additional copies of approved shop drawings shall be furnished as required for coordination of the work of the various trades.
- F. Number of Shop Drawings Required:
1. One (1) hard-copy print and one electronic file copy of the entire submittal, shall be submitted of each submittal. The hard-copy shall be bound as a single entity for each submittal. ALL information present in the hard-copy, and no information absent from the hard-copy, shall be contained in a single electronic file as a single submittal.
  2. After the submittal has been reviewed and stamped, a copy of the electronic file will be kept at the office of the Architect, a copy of the electronic file will be kept at the office of the Engineer.
  3. One (1) reviewed copy of the electronic file will be returned to the Contractor, from which he shall make as many hard-copies as he feels is needed for the prosecution of the Work.
  4. The Architect will not furnish additional copies to the Contractor.
- G. Architect's Review of Submittals: The Architect/Engineer shall review and approve or take other appropriate action on the Contractor submittals, such as shop drawings, product data, samples and other data, which the Contractor is required to submit, but only for the limited purpose of checking for conformance with the design concept and the information shown in the Construction

Documents. This review shall not include review of the accuracy or completeness of details, such as quantities, dimensions, weights or gauges, fabrication processes, construction means or methods, coordination of the work with other trades or construction safety precautions, all of which are the sole responsibility of the Contractor. The Architect/Engineer's review shall be conducted with reasonable promptness while allowing sufficient time in the Architect/Engineer's judgment to permit adequate review. Review of a specific item shall not indicate that the Architect/Engineer has reviewed the entire assembly of which the item is a component. The Architect/Engineer shall not be responsible for any deviations from the Construction Documents not brought to the attention of the Architect/Engineer in writing by the Contractor. The Architect/Engineer shall not be required to review partial submissions or those for which submissions of correlated items have not been received.

- H. Time Required for Architect's Review: Shop drawings shall be submitted in time to allow **not less than two weeks for processing by the Architect, plus an additional week for submittals requiring review by an engineer including mechanical, electrical, structural and civil engineering or those items requiring review by a consultant such as kitchen equipment, detention facility equipment and/or acoustical consultants.**

#### 1.11 PRODUCT DATA:

- A. General: See Paragraph 3.12 of the General Conditions for provisions pertaining to shop drawings.
- B. Collect the required data into one submittal for each material, product or system; and mark each copy to show which choices and options are applicable to the project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements. Maintain one set of product data (for project site, available for reference by the Architect, Engineer or others).
- C. The Architect will require a minimum of four (4) copies to be submitted of Product Data which has not been originally prepared on copyable material. The Architect will retain one copy, one copy will be retained by the Engineer and two copies will be returned to the Contractor. Therefore, if the Contractor desires more than two (2) copies with two copies returned to him, he must add to the minimum number of copies required to be submitted.
- D. Information not exclusively pertinent to the Project shall be deleted so that there is no possible area of confusion as to what product, series or model is to be examined. The Architect or Owner will not take responsibility for having examined a product that was not intended by the Contractor to be judged.

#### 1.12 SAMPLES AND MOCKUPS:

- A. Samples and mockups shall faithfully represent the product or the assembly as it is proposed to be installed. This shall include, but not be limited to, materials, finishes, method of construction or assembly, relationship to adjacent construction, method of attachment to adjacent construction, plus any electrical or mechanical connection that are required for the product or assembly to function. Include "range" samples (not less than 3 units) where variations occur, and identify each unit of each set.
- B. All samples shall have a label or tab containing the required information firmly affixed thereto.
- C. Unless the precise color and pattern is specifically described in the Contract Documents, whenever a choice of color or pattern is available in specified product submit accurate color charts and pattern charts to the Architect for his review and selection. Provide full sets of optional samples where Architect's selection is required. Prepare samples to match the Architect's sample where so indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards.

- D. Samples and color charts shall be physical specimens of materials or colors proposed to be provided. Selections and approval of samples will be made by the Architect from these submitted samples and color charts, without increase in costs to the Owner or Architects. Should the Contractor desire a sample returned, he shall submit a sufficient number in order for the Architect to retain one (1) sample and return the remainder to the Contractor.
- E. In order for the Architect to make a color schedule as quickly as possible and to avoid delivery and pricing problems, the Contractor shall be required to submit all items that require a color selection within 40 days of the Notice to Proceed. Delivery and pricing problems that develop because an item was not submitted within the forty (40) day time limit, shall be the sole responsibility of the Contractor and not that of the Owner.
- F. The color selection on any one item will not be made until after samples of all items that require a color selection have been submitted.

1.13 AS BUILT SURVEY:

- A. Provide hard-copy AND electronic (on CD or DVD) topographic "As-built" survey in conformance with 2011 ALTA standards. Survey shall contain the certification statement found in HUD Form 92457M. Said HUD document shall also be completed and submitted along with survey which shall be dated within 120 days of final closing.
  - 1. Show size, location and depth of buried tanks or structures if possible.
  - 2. Provide topographic survey at one (1) foot contours.
  - 3. Locate all on-site utilities:
    - a. Top and invert of all sanitary and storm sewers installed on site. Show pipe size and materials, including pipes to daylight and/or detention ponds, on or off site (give direction of flow).
    - b. All gas, water, electric, sewage installed on site – indicate size, depth, pressure and materials.
  - 4. Locate any and all fire hydrants installed on the site.
  - 5. Give benchmark elevation and location and state the source of the vertical datum. Tie benchmark to survey provide as part of Construction Documents.
  - 6. Provide topography 50 feet beyond extent of grading work performed on site.
  - 7. Provide name, address and phone number for the following:
    - a. Building Department officials approving installation and connection of utility lines to public utilities.
    - b. Utility companies having jurisdiction over property
  - 8. Provide progress print to Architect prior to supplying vellum.
  - 9. Provide one (1) print of stamped and signed survey to Architect upon completion.
  - 10. Provide a digital file of final survey in an AutoCAD .dwg or .dxf format.
  - 11. Tie site to locally established horizontal and vertical datum in relation to state plane coordinates if within 200 feet of site and/or if site is within a designated flood hazard plain.

1.14 ARCHITECT'S ACTION:

- A. The stamps of the Architect on returned shop drawings, product data and samples shall be interpreted as follows:
1. Received: Acknowledges receipt. No action taken.
  2. Reviewed, No Exceptions Taken: No corrections. Proceed with the work.
  3. Furnish as Noted: May proceed with work as noted; shop drawings bearing this stamp must submit revised and resubmitted for record.
  4. Revise and Resubmit: No work shown shall be fabricated or furnished until shop drawings have been revised and resubmitted for further checking or approval.
  5. Rejected: Work shown is not in accordance with Contract requirements and is rejected. Make new submittals.
  6. Submit Specified Item: No substitutions permitted for this item. Make new submittals.

1.15 SUBMITTAL SCHEDULE:

- A. After development and acceptance of the Contractor's Construction Schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for submittal of the Contractor's Construction Schedule.
- B. Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Contractor's
- C. Prepare the schedule in chronological order. Provide the following information for each submittal.
- Scheduled date for the first submittal.  
Related Section Number  
Submittal category (Shop Drawing, Product Data, or Sample)  
Name of the subcontractor  
Description of the part of the Work covered  
Scheduled date for Architect's final release or approval.
- D. Following approval of initial submittal, print and distribute copies to the Architect, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.
- E. Revise the schedule monthly and issue the updated schedule concurrently with each Application and Certificate for Payment.

1.16 SUBMITTAL SEQUENCE:

- A. The right is reserved by the Architect to examine submittals and samples in a proper sequence that reflects the logical sequence of erection, installations, and proper assembly. Submittals of products or materials that are the responsibility of separate Trades yet must be assembled in conjunction one with another, shall be submitted at the same time so that they may be examined all together. Should these not be submitted simultaneously, the Architect reserves the right to hold one set while awaiting the arrival of other submittals.
- B. All submittals within the responsibility of one Trade must be submitted at one time together (i.e. millwork). Numerous submittals of one product or item of construction over a period of time is not acceptable. In the event of this occurrence, the Architect will hold the submittal data arriving first until the last of the material has arrived. Then, and only then, will he make his examination.

1.17 TIMING OF SUBMITTALS:

- A. Make all submittals far enough in advance of scheduled dates for installation to provide all required time for reviews, for securing necessary approvals, for possible revision and resubmittals, and for placing orders and securing delivery.

- B. Costs of delays occasioned by tardiness of submittals may be back-charged as necessary and shall not be borne by the Owner.

1.18 RECORD DRAWINGS:

- A. In addition to the record drawings specified in Paragraph 3.11 of the General Conditions, the Contractor shall assure that the record drawings for the mechanical, plumbing, fire protection and electrical work, as specified under Division 15 and 16 respectively, are properly maintained by his subcontractor and upon completion of the work shall deliver them to the Architect for the Owner.

1.19 CONTRACT CLOSE-OUT SUBMITTALS:

- A. As a precedent to final acceptance of the work and issuance of Certificate of Final Payment, including the Release of Retainage, certain submittals shall be made as specified in the various sections of the specifications. All such submittals shall be delivered to the Architect, in the form and number of copies specified, prior to or with the Contractor's request for final payment. Submittals shall include but not be limited to:
1. General Contractor's Affidavit, Waiver and Release of Lien Statements and Consent of Surety, to final payment **as well as release of lien statements from all subcontractors and major material suppliers** as specified in Subparagraph 9.10.2 of the General Conditions. **These documents shall be addressed to the Owner, and shall be original signed documents and not reproduced copies. Two (2) sets of these drawings shall be submitted.**
  2. Written guarantees and warranties as specified in the various other sections of the specifications.
  3. Record drawings as specified in the General Conditions and in Divisions 15 and 16.
  4. One copy of each final approved shop drawing submitted during the course of the project.
  5. Three copies of operation and maintenance data for mechanical equipment and electrical equipment.
  6. Letter stating that to the best of the Contractor's knowledge, no asbestos containing materials or other Work hazardous materials or products as currently defined in the Resource Conservation and Recovery Act of 1976 (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or Environmental Protection Agency (EPA) regulations, rules, or requirements, as amended
  7. Contract Close-Out Submittals, except for record drawings, shall be submitted in commercial quality three ring binders with durable plastic covers. Identify the project on the face and side of the binders. Provide a cover sheet giving complete Project Title, Contractor's and Architect's name, address, phone number, name of project superintendent, and related general information. Include a Table of Contents to identify material in the Project Data Binders and a complete listing of subcontractors and material suppliers. Provide copies of all Certificates, Warranties and related documents as well as Product Data, Maintenance and Operation Data and related information required by the Contract Documents or furnished with items included in the Project. Two (2) sets of these documents shall be submitted.

End of Section



# Submittal Cover Sheet

Submittal No.: \_\_\_\_\_

Contractor: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

Project Manager: \_\_\_\_\_

Email: \_\_\_\_\_

Project Title: \_\_\_\_\_ Architect's Comm. No.: \_\_\_\_\_

Spec Section Title: \_\_\_\_\_ Section No.: \_\_\_\_\_

Sub / Supplier: \_\_\_\_\_ Phone: \_\_\_\_\_

YES

☐

NO

☐

**Product is as Specified**

If not as specified attach Substitution request form  
Section 00 63 25

**Contractor's Review Stamp**

Remarks: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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## SECTION 01 35 00 – SPECIAL PROJECT PROCEDURES:

### PART 1 GENERAL

#### 1.01 PROGRESS SCHEDULE:

- A. In addition to the progress schedule required by Paragraph 3.10 of the General Conditions, the Contractor shall also submit his proposed scheme of work for approval, describing proposed methods and sequences of work from beginning to completion of the work and their correlation with the Owner's requirements.
- B. When the Contractor's proposed sequence of work has been approved by the Owner, it shall become the time schedule for the work and shall be adhered to as closely as possible by both the Contractor and the Owner, except that mutually agreeable modifications may be made from time to time to meet unforeseen extingencies.

#### 1.02 TIME OF PERFORMING WORK:

- A. Generally, the Contractor will be permitted to conduct his work in the building and on the premises during his regular working hours.
- B. The building must have the HVAC system operational and maintained at a constant temperature prior to installing any building finishes, except metal support systems.

#### 1.03 OBSTRUCTIONS:

- A. All obstructions encountered during the construction of the Contract work shall be overcome by the Contractor by removal or alteration of work in place, by adjustments in the new work, or by temporary removal and reinstallation of existing work.

#### 1.04 CLEANING UP:

- A. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- B. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- C. Exposed Surfaces in Finished Areas: Clean exposed surfaces
- D. Upon completion of the work, remove spots, stains, dirt, and dust from finished surfaces, both new and existing, including the surfaces of all existing machinery, equipment, and exposed piping that have been soiled by the construction. Protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- E. Clean and mop hard surface flooring and resilient flooring and vacuum clean carpet flooring
- F. Wash all glass and clean plumbing fixtures, lighting fixtures, and mechanical equipment.
- G. Comply with all special cleaning instructions contained in the various other sections of the specifications.
- H. Protect new and existing surfaces from the growth and spread of mold and mildew. If mold and mildew occur, notify Architect prior to proceeding. Retain qualified testing agency to document and direct remediation. Remediate or replace surfaces to stop the growth and spread of mold and mildew as deemed necessary by a qualified testing agency acceptable to the Contractor, Owner and Architect.
  - 1. Pay for necessary testing and perform all abatement work required to remedy condition.

1.05 INSPECTION OF WORK IN PLACE:

- A. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities. The architect is to be given advanced notification for inspection of Structural, Mechanical, Plumbing, and Electrical work prior to said work being covered.
- B. Contractor shall give architect advanced notification for final inspection punch list prior to Owner occupying space.

1.06 SMOKING AND FIRE PRECAUTIONS

- A. No fire, or use of any fire, or explosion-producing tools or equipment will be permitted on the property
- B. This facility is a designated non-smoking facility. Smoking will not be permitted in the facility or within 20 feet of any entrance.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

End of Section

## SECTION 01 40 00 – QUALITY CONTROL

### PART 1 GENERAL

#### 1.01 QUALITY CONTROL:

- A. The density of compaction of fill and backfill and the quality of concrete shall be controlled by field testing during construction and laboratory testing prior to start of construction as specified in Section 31 20 00 Earthwork and 03 30 00 Cast-In-Place Concrete, respectively.

#### 1.02 TESTS:

- A. Engage inspection and test service agencies, including independent testing laboratories, which comply with “Guidelines for Effective Practice for Materials Engineering Laboratories” by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.
- B. Tests required to establish compliance with the Contract requirements for quality control shall be made by a testing agency acceptable to the Contractor, the Owner and the Architect with reports certified by the laboratory and furnished in duplicate to the Architect with a copy to the Contractor.
- C. Representatives of the testing agency and monitoring shall have access to the work at all times. The Contractor shall provide facilities for such access and samples as necessary so that the testing agency may properly perform its function.
- D. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to the following:

Name of testing agency or testing laboratory.

Dates and locations of samples and test or inspections.

Names of individuals making the inspection or test.

Complete inspection or test data.

Test results

Interpretations of test results.

Notation of significant ambient conditions at the time of sample taking and testing.

Comments or professional opinion as to whether inspected or tested work complies with requirements of the contract documents.

Recommendations on retesting, if applicable.

- E. Non-Compliant Inspection/Test Results: Within 24 hours of inspection/test being performed, notify Architect/Engineer of-Record, and the Contractor of any non-conforming/non-compliant inspections/tests. Copies of successful retests of the originally non-conforming/non-compliant work shall be submitted to the Architect/Engineer-Of-Record and the Contractor.
- F. Project Closeout: the Contractor shall certify to the Architect of Record that the required quality control services, as required by this section and the contract documents have been performed and that all results indicate compliance with requirements.

#### 1.03 COST OF TESTS:

- A. The cost of the services of the testing agency and monitoring shall be paid by the Contractor. When the tests indicate noncompliance with the Contract requirements, any subsequent and retesting occasioned by noncompliance shall be performed by the same testing agency and the costs shall be borne by the Contractor.

1.04 NOTIFICATIONS OF THE ARCHITECT:

- A. Notify architect within 24 hours before any work is completed for areas as described in paragraph B below. If the architect is not notified as stated above and the contractor proceeds with the work, the architect shall have authority to direct the contractor to remove part or all of the installed materials at the contractor's expense for a detailed observation.
- B. The Architect shall be notified at the following points of work:
  - 1. Footing bottoms and concrete reinforcement prior to pouring any concrete.
  - 2. Waterproofing/Damp-proofing prior to any backfilling work.
  - 3. Water drainage test on sloped concrete floors prior to finish floor materials installed.
  - 4. Thru-wall flashing installation and mortar mix prior to installing any masonry.
  - 5. Completed structural steel erection before floor slabs are poured.
  - 6. Mechanical and Electrical systems above ceiling inspection prior to installation of finish ceiling material.
- C. The respective contractor and/or subcontractor shall correct any deficiencies that may be observed. Construction work observations or lack thereof by the architect does not relieve the contractor and/or subcontractor from any liability of faulty workmanship that may have occurred or may occur at a later date.

1.05 OTHER TESTS:

- A. See provisions of the General Conditions regarding tests required by governing authorities.
- B. The provisions of Divisions 22-23 and 26 for tests required for mechanical and electrical work.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION:

- A. Upon completion of inspection, testing, sample taking, and similar services, repair damaged work and restore substrates and finishes to eliminate all deficiencies. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

End of Section

## SECTION 01 50 00 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

### 1PART 1 GENERAL

#### 1.01 UTILITIES SERVICES FOR CONSTRUCTION PURPOSES:

- A. The Contractor shall provide all necessary temporary utilities as required for construction purposes. The utility costs will be paid by the Contractor.
- B. The Contractor shall furnish and install all temporary piping and wiring required for the use of these services during construction and upon completion of the work shall remove such temporary piping and wiring.
- C. The use of existing services shall be in such a manner and by such methods that will not interrupt the services to any of the Owner's facilities that are to remain in operation during construction.

#### 1.02 BARRICADES AND SPECIAL CONTROLS:

- A. Provide temporary barriers, fences, and warning signs around the sites of new buildings to control access of unauthorized persons to work areas, and as required by law. Special care shall be taken to provide adequate barriers and warning signs to prevent access of unauthorized persons to work areas where hazardous work is being performed.
- B. Provide temporary barriers and warning signs at excavations that might be left open during nonworking hours, including warning lights at night.

#### 1.03 CONSTRUCTION AIDS:

- A. Provide necessary staging, scaffolding, and hoisting equipment and temporary walkways and ladders required for installation of the work under the Contract.

#### 1.04 TEMPORARY BUILDINGS:

- A. Provide temporary field office and storage sheds as required to carry on the work. Adequate space shall be provided in the field office for convenient use and storage of Contract Drawings and Specifications, approved shop drawings, samples, and field records. Truck trailers may be used for temporary field office and storage enclosures.
- B. Upon completion of the work, all temporary buildings shall be removed and the area of the site that they occupied shall be restored to its condition at the commencement of work under the Contract.

#### 1.05 SANITARY FACILITIES:

- A. Provide adequate temporary toilet facilities for the use of workmen, conforming to applicable laws, ordinances, and governmental regulations.
- B. Upon completion of the work, temporary toilet facilities shall be removed from the site.
- C. Provide temporary sanitary facilities for use of the Building Occupants during the course of construction during time existing sanitary facilities have been removed from service and before new facilities are available for use of building occupants.
  - 1. Provide separate portable toilets for men and women.
    - a. Service portable toilets weekly at a minimum during the time they are in service.

#### 1.06 TEMPORARY ENCLOSURES:

- A. Provide temporary weathertight closures for all exterior openings after walls and roof of the new building are constructed when it is necessary to protect the work from the weather and to permit the use of temporary heat. Provide weathertight and security protection of the existing building until what time as the new construction is able to provide weathertightness and security. Provide safety barriers as required to protect the occupants of the building.
- B. Water Protection: Provide at all items for protection of excavation, trenches, and building from damage by rain water, spring water, ground water, backing up of drains or sewers, and all other water. Provide all pumps, equipment, temporary drains or dams, and enclosures necessary to provide this protection.

1.07 TEMPORARY HEAT AND VENTILATION:

- A. Provide temporary heat and ventilation as necessary for protection and drying out of the work and to allow work to be prosecuted in cold weather.
- B. Heat shall be provided by means of approved temporary heating equipment which in installation and operation will not damage the work. Provide adequate and proper fuels and all services required to furnish heat as required. Salamanders shall not be used inside the building. Heaters used to dry out or protect freshly placed concrete shall be of a type and shall be so ventilated as to prevent carbon dioxide from damaging concrete.
  - 1. After the construction of the building has reached a point where the permanent heating and cooling systems are operable, the Contractor may use the permanent heating and cooling equipment for temporary heating and cooling. The heating and cooling systems shall not be used for temporary heat and cooling until the building is broom clean and shall not be used without all filters in place. Upon the completion of the work, all ducts and equipment shall be internally cleaned and all filters shall be replaced with new filters.
    - a. If permanent HVAC system for temporary use during construction is used, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 01 77 00.
  - 2. Contractor shall pay the hourly rate of the Engineer's and Testing and Balancing Agent's technical personnel to observe and document the condition of equipment and ductwork (30 minutes average per unit) used for construction term temporary heating and cooling. Engineers inspection of heat transfer coils must be complete prior to start-up, test and balance, and final acceptance. All warranties shall begin upon final acceptance by the Owner, not beneficial usage by the Contractor.
- C. Costs of providing temporary heat shall be borne by the Contractor.

1.08 BULLETIN BOARD AND JOB SIGN:

- A. On or near the field office, the Contractor shall install a bulletin board upon which to post legally required notices. The bulletin board shall be of adequate size to contain all required notices and be so constructed as to protect the postings from obliteration by the weather.
- B. The Architect shall provide one painted sign stating the Architect (Michael Brady Inc.). Location of sign shall be as directed by the Architect. The Contractor shall erect a substantial wood frame to support the sign provided by the Architect.
- C. Maintain all bulletin boards and job signs in good condition from start to completion of the work.

1.09 RODENT AND VERMIN CONTROL:



- A. Provide on the project site ample and suitable refuse containers with covers. The Contractor shall be responsible for containing and removing from the site all refuse from meals eaten on the site and other rodent or vermin attracting refuse.
- B. During the construction period precaution shall be taken as necessary to control the entry and breeding of rodents and vermin in the new building.
- C. If, within three months after occupancy of the building, the building is found to be infested by rodents or vermin, the Contractor shall bear the cost of extermination.

1.10 REMOVAL OF CONSTRUCTION DEBRIS:

- A. Provide suitable containers for and maintain a regular schedule for the removal of debris and rubbish from the construction site and surrounding area.
- B. Pay all container rental fees, hauling, and landfill costs associated with the removal of debris and rubbish from the site.

1.11 PROTECTION:

- A. Weather Protection: Provide at all times protection against rain, wind, storms, frost, or heat so as to maintain all work, materials, equipment and fixtures free from injury or damage. At end of days work, all new work likely to be damaged by weather conditions shall be covered.
- B. Water Protection: Provide at all times protection of excavation, trenches, and building from damage by rain water, spring water, ground water, backing up of drains or sewers, and all other water. Provide all pumps, equipment, temporary drains or dams, and enclosures necessary to provide this protection.
- C. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- D. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

- E. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings, requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
  - 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
  - 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
  - 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
  - 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

1.12 TELEPHONE:

- A. Install a single party telephone or a cellular phone and a facsimile machine or computer capable of sending and receiving email in the field office. The telephone shall be available for use by all persons concerned with the construction of the project and service shall be maintained from start to completion of the work. The cost of the telephone service shall be paid by the Contractor.

2PART 2 PRODUCTS

NOT USED

3PART 3 EXECUTION

NOT USED

End of Section

## SECTION 01 60 00 – PRODUCT REQUIREMENTS:

### 1PART 1 GENERAL

#### 1.01 STORAGE OF MATERIALS AND EQUIPMENT:

- A. Coordinate with HUD regarding the location and storage of materials and equipment off-site. HUD approval is required for payment of such stored items. Any materials stored off-site without prior coordination, including escrowed funds and proper off-site storage agreement, may result in payment issues when the Inspector makes monthly draw inspections.
- B. Storage of materials and equipment, location of field office, space for truck deliveries and parking of workmen's cars shall be restricted to areas of the site mutually agreed upon by the Contractor and the Owner prior to commencement of construction.
- C. Storage of materials and equipment and truck deliveries shall not interfere with normal pedestrian and vehicular traffic.
- D. Upon completion of the work, all damage to existing ground cover, paving, site improvements, or existing structures resulting from the storage of materials and equipment, construction vehicular traffic, or other construction operations under the Contract shall be repaired by the Contractor to its condition at commencement of work under the Contract.

#### 1.02 PROTECTION OF MATERIALS AND EQUIPMENT:

- A. Material and equipment stored on the site that are to be incorporated in the work shall be adequately protected from damage by the weather or by construction operations.
- B. Materials subject to damage by water shall be blocked off the ground and protected with waterproof coverings, stored in weathertight floored sheds or in the building after it is enclosed.
- C. Material that is subject to damage by soiling or by exposure shall be stored as to prevent physical damage to the materials and equipment.
- D. Materials and equipment shall be so transported, handled, and stored as to prevent physical damage to the materials and equipment.

#### 1.03 SUBSTITUTIONS:

- A. All materials and equipment incorporated in the work shall be new and as specified, except such substitutions that are approved as provided by the provisions for substitutions set forth in the Supplementary Conditions.
- B. Where substitutions are implemented, the Contractor shall be responsible for insuring that:
  - 1. The proposed substitution does not affect dimensions shown on Drawings.
  - 2. He will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
  - 3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
  - 4. Maintenance and service parts will be locally available for the proposed substitution.

### 2PART II PRODUCTS

NOT USED

### 3PART III EXECUTION

NOT USED

End of Section

## SECTION 01 74 10 – CLEANING

### PART 1 GENERAL

#### 1.01 DESCRIPTION

- A. Work Included: Throughout the construction period, maintain the roof, buildings and site in a standard of cleanliness as described in this section.
- B. Related Work Described Elsewhere: In addition to standards described in this section, comply with all requirements for cleaning up as described in various other sections of these specifications.

#### 1.02 QUALITY ASSURANCE

- A. Inspection: Conduct inspection daily, and more often if necessary, to verify that requirements for cleanliness are being met.

### PART 2 PRODUCTS

#### 2.01 CLEANING MATERIALS AND EQUIPMENT

- A. Provide all required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

#### 2.02 COMPATIBILITY

- A. Use only cleaning materials and equipment that are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as approved by the A/E.

### PART 3 EXECUTION

#### 3.01 PROGRESS CLEANING

- A. General:
  - 1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.
  - 2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for the construction of this work.
  - 3. At least once a day and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
  - 4. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the ecology.
- B. Site:
  - 1. Daily and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
  - 2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Restock, tidy, or otherwise service all arrangements to meet the requirements of 3.01.A.1, above.
  - 3. Maintain the site in a neat and orderly condition at all times. Use a magnet to remove small metal objects such as nails, fasteners, etc.

C. Structures:

1. The Contractor will be responsible for maintaining the existing level of cleanliness on any interior areas used by subcontractors or employees.

End of Section

## SECTION 01 74 23 – FINAL CLEANING

### PART 1 GENERAL

#### 1.01 GENERAL:

- A. General cleaning of construction debris is required by the General Conditions and included in Section 01 77 10 Cleaning.

#### 1.02 CLEANING:

- A. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- B. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
- C. Remove labels that are not permanent labels.
- D. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
- E. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces. Mop and polish resilient flooring.
- F. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
- G. Not more than 4 days before date scheduled for final inspection, clean flooring according to manufacturer's recommendations. Strip protective floor polish that was applied after completing installation only if required to restore polish finish and if recommended by flooring manufacturer. After cleaning, reapply polish to floor surfaces to restore protective floor finish and buff according to flooring manufacturer's written recommendations
  - 1. Coordinate with Owner's custodial personnel and use Owner's selected materials for sealing and polishing floors.
- H. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

#### 1.03 REMOVAL OF PROTECTION:

- A. Remove temporary protection and facilities installed for protection of the Work during construction.

#### 1.04 COMPLIANCE:

- A. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
- B. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

End of Section



## SECTION 01 77 00 – CONTRACT CLOSEOUT:

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES:

- A. Closeout procedures.
- B. Owner's Operating Instruction Session.
- C. Adjusting.
- D. Operation and Maintenance Data.
- E. Project record documents.
- F. Warranties

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBSTANTIAL COMPLETION:

- A. Notify the Owner not less than twenty-one (21) days prior to the date of substantial completion to allow notification of tenants.
- B. Submit written certification to Architect that Project, or designated portion of Project, is substantially complete. Include a list of items to be completed or corrected as a result of his inspection of the work.
- C. Submit the Certificate of Occupancy issued by the local building authority to the Architect for forwarding to the Owner.
- D. The Architect will make an inspection within seven (7) days after receipt of certification, together with Owner's Representative.
- E. Should the Architect consider the work substantially complete:
  - 1. The Contractor shall prepare, and submit to the Architect, a list of items to be completed or corrected, as determined by the Architect's inspection.
  - 2. The Architect will prepare and issue a certificate of substantial completion, AIA document G704, complete with signatures of Owner, Contractor, and Architect, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Architect.
  - 3. The Owner will occupy the project, under provisions stated in certificate of substantial completion.
  - 4. The Contractor will complete work listed for completion or correction, within the designated time.
  - 5. Refer to Supplementary Conditions Article 9.10.6 for failure to complete in a timely manner.
- F. Should the Architect consider that the Work is not Substantially Complete:

1. He shall immediately notify Contractor, in writing stating reasons.
2. The Contractor shall complete the Work, and send second written notice to the Architect, certifying that the project or designated portion of project, is substantially complete.
3. The Architect will reinspect the work at the Contractor's expense.

1.04 OWNER'S OPERATING INSTRUCTION SESSION:

- A. Conduct training session for Owner's designated personnel covering various mechanical, electrical, and other operating features for familiarization with the physical plant equipment and operation. One copy of the required (see various technical sections on project closeout) mechanical operations manual shall be on hand during this session along with the mechanics familiar with all equipment. These mechanics shall have on hand such tools and/or equipment to reveal controls and mechanic access areas. The instruction session shall be scheduled for a full day but in no case less than the minimum time required to review each type of equipment/operation. The minimum areas of instruction shall be:
1. Location and operation of project site water valves, meters and other operational equipment.
  2. Location and operation of project electrical disconnects.
  3. Operation of sewage handling facilities.
  4. Sprinkler valves, alarms, test and operation.
  5. Project landscape irrigation operation.
  6. Project Site lighting operation/maintenance.
  7. Storm sewer operation/configuration.
  8. Refuse containment areas.
  9. Roof maintenance/warranty considerations. Traffic cautions.
  10. HVAC unit operations/maintenance (filters and thermostats, boiler and/or cooling tower maintenance).
  11. Interior lighting, lamp and ballast replacement.
  12. Keying and lock operations.
  13. Locations and use of required replacement finish materials such as floor and ceiling tiles and panels.
  14. Notification procedures for Contractor warranty work.
- B. Video Tape Owner's Instruction Session and provide two (2) copies on DVD to Owner as part of Close Out Documentation.

1.05 CLOSEOUT PROCEDURES AT FINAL COMPLETION:

- A. Provide hard-copy AND electronic (on CD or DVD) "As-built" documents complying with the General Conditions herein and in conformance with the 2011 ALTA standards. Survey shall contain the certification statement found in HUD Form 92457M. Said HUD document shall also be completed and submitted along with survey which shall be dated within 120 days of final closing.

- B. As a precedent to final acceptance of the work and issuance of Certificate of Final Payment, including the Release of Retainage, certain submittals shall be made as specified in the various sections of the specifications. All such submittals shall be delivered to the Architect, in the form and number of copies specified, prior to or with the Contractor's request for final payment. Submittals shall include but not be limited to:
1. General Contractor's Affidavit, Waiver and Release of Lien Statements and Consent of Surety, to final payment as well as release of lien statements from all subcontractors and major material suppliers as specified in Subparagraph 9.10.2 of the General Conditions. These documents shall be addressed to the Owner and shall be original signed documents and not reproduced copies. Two (2) sets of these drawings shall be submitted.
  2. Written guarantees and warranties as specified in the various other sections of the specifications.
  3. Record drawings as specified in the General Conditions and in Divisions 15 and 16.
  4. One copy of each final approved shop drawing submitted during the course of the project.
  5. Three copies of operation and maintenance data for mechanical equipment and electrical equipment.
  6. Letter stating that to the best of the Contractor's knowledge, no asbestos containing materials or other Work hazardous materials or products as currently defined in the Resource Conservation and Recovery Act of 1976 (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or Environmental Protection Agency (EPA) regulations, rules, or requirements, as amended
  7. Contract Close-Out Submittals, except for record drawings, shall be submitted in commercial quality three ring binders with durable plastic covers. Identify the project on the face and side of the binders. Provide a cover sheet giving complete Project Title, Contractor's and Architect's name, address, phone number, name of project superintendent, and related general information. Include a Table of Contents to identify material in the Project Data Binders and a complete listing of subcontractors and material suppliers. Provide copies of all Certificates, Warranties and related documents as well as Product Data, Maintenance and Operation Data and related information required by the Contract Documents or furnished with items included in the Project. Two (2) sets of these documents shall be submitted.
- C. Submit written certification that the Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for final inspection by Owner and Architect.
- D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments and sum remaining due.
- 1.06 WARRANTIES:
- A. Provide notarized copies.
  - B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
  - C. Provide Table of Contents and assemble in three D side ring binders with durable plastic covers. Note: This is in addition to copies of warranties provided with operation and maintenance binders.
  - D. Submit prior to final Application for Payment.

- E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing date of acceptance as warranty period.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.
- B. Deliver to Project site and place in location as directed, obtain receipt prior to final payment.

End of Section

## SECTION 03 30 00 – CONCRETE WORK

### 1PART I GENERAL

#### 1.01 SCOPE:

- A. The extent of concrete work is shown on the drawings.

#### 1.02 SUBMITTALS:

- A. Submit manufacturer's product data with application and installation instructions for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing and sealing compounds, and others requested by the Architect.
- B. Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with the ACI 315, Details and Detailing of Concrete Reinforcement, showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Show on the shop drawings special reinforcement required and openings through concrete structures.
- C. Submit two (2) copies of laboratory test reports with standard deviation analysis or trial batch data. All concrete materials shall be listed.

#### 1.03 QUALITY ASSURANCE:

- A. Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified.
  - 1. ACI 301, Specifications for Structural Concrete for Buildings
  - 2. ACI 302, Guide for Concrete Floor and Slab Placement
  - 3. ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete
  - 4. ACI 305, Hot Weather Concreting
  - 5. ACI 306, Cold Weather Concreting
  - 6. ACI 315, Detailing Manual
  - 7. ACI 318, Building Code Requirements for Reinforced Concrete
  - 8. ACI 347, Recommended Practice for Concrete Formwork
  - 9. CRSI Manual of Standard Practice
  - 10. ACI 211.1 Standard Practice for Selecting proportions for Normal, Heavyweight, and Mass Concrete.
  - 11. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete.
- B. The Contractor is responsible for correcting concrete work that does not conform to the specified requirements, including requirements for strength, tolerances, and finishes.
- C. Employ at the Contractor's expense a testing laboratory acceptable to the Owner and the Architect to perform material evaluation tests and to design and review concrete mixes. Submit copies of all tests as specified elsewhere and one additional copy to the Owner.
- D. The Contractor shall be responsible for the cost of any testing services needed or required by the Contractor.

#### 1.04 INSPECTIONS AND TESTING:

- A. Materials and operations shall be inspected and tested as work progresses. Failure to detect defective work shall not prevent rejection when defect is discovered, nor shall it obligate the Owner for final acceptance.

- B. Testing agencies shall meet the requirements of "Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials As Used in Construction," ASTM E 329.
- C. The following testing service shall be performed by the designated agency and shall be paid for by the Contractor. A representative of the agency, shall observe the placing of all designated concrete.
1. Secure composite samples in accordance with "Standard Method of Sampling Fresh Concrete," ASTM C 172.
  2. Mold and cure three specimens from each test required in accordance with "Standard Method of Making and Curing Concrete Test Specimens in the Field," ASTM C 31.
  3. Test specimens in accordance with "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens," ASTM C 39. Two specimens shall be tested at 28 days for acceptance and one shall be tested at 7 days for information.
  4. Make one strength test for each 100 cu. yd. (76.5 m<sup>3</sup>) or fraction thereof, of each mix design of concrete placed in any one day.
  5. Determine slump of normal-weight concrete sample for each strength test in accordance with "Standard Test Method for Slump of Portland Cement Concrete," ASTM C 143.
  6. Determine total air content of normal-weight concrete sample for each strength test in accordance with "Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method," ASTM C 231 or "Standard Test Method for air content of freshly mixed concrete by the Volumetric Method," C-173.
  7. The water content of freshly mixed concrete will be tested each time cylinders are made and as directed by the Engineer in accordance with AASHTO TP 23, Standard Method of Test for Water Content of Freshly Mixed Concrete Using Microwave Oven Drying.
  8. Determine temperature, unit weight, yield and air content (gravimetric) of concrete sample for each strength test in compliance with ASTM C 138, "Standard Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete."
  9. If water is added at the site, the designated agency shall retest the concrete in accordance with "Standard Test Method for Slump of Portland Cement Concrete" plus whatever other tests the designated agency feels are necessary. No water will be added at the site without the approval of the designated agency.
  10. Qualification of proposed materials and the establishment of mix designs in accordance with "Building Code Requirements for Reinforced Concrete," ACI 318.
  11. Non-Compliant Test Reports: All test reports indicating non-compliance should be faxed immediately to all parties on the test report distribution list. Copies shall be on different colored paper.
  12. Test results will be reported to the Architect and Contractor in writing on the same day that the test is made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in the structure, design compressive strength at 28 days, concrete mix proportions and materials, and compressive breaking strength and type of break for both 7 day tests and 28 day tests.
  13. Perform additional tests of in-place concrete when the test results indicate that the required strength level has not been achieved and other characteristics have not been attained in the structure, as directed by the Architect. The testing service may conduct

tests to determine the adequacy of concrete by cored cylinders that comply with ASTM C42 or by such other methods as are directed by the Architect. The Contractor shall pay for such tests and any additional testing that may be required when concrete is verified to be unacceptable.

14. Employ, at the Contractor's expense, a testing laboratory to perform Flatness/Levelness Testing. Comply with ASTM E-1155-96, but provide a minimum of one line of sampling in two perpendicular directions through each structural bay.

- a. Perform testing using a "Dipstick Profiler" within 72 hours of concrete placement.
- b. Supplement Dipstick testing with the use of a 10 foot certified straight edge placed randomly on the floor. Floor surface shall not exceed 3/8" below edge of straight edge anywhere along its surface when ends are placed on adjacent high spots.

- D. To facilitate testing and inspection, the Contractor shall:

1. Furnish labor to assist testing agency in obtaining and handling samples at the job site.
2. Advise testing agency in advance of operations to allow for the assignment of testing personnel and testing.
3. Provide and maintain for the use of the testing agency adequate facilities for proper curing of concrete test specimens on the project site in accordance with ASTM C 31.

## 2PART II PRODUCTS

### 2.01 FORM MATERIALS:

- A. Forms for Exposed Finish Concrete: Unless otherwise specified or shown on the drawings, construct formwork for exposed concrete surfaces with plywood, metal, metal framed plywood, or other panel type materials acceptable to the Architect in order to provide exposed surfaces that are continuous, straight, and smooth. To minimize the number of joints and to conform to the joint system shown on the drawings, furnish panels in the largest practicable sizes. Provide form material that is thick enough to withstand pressure of newly placed concrete without bowing or deflection.
- B. Forms for Unexposed Finish Concrete: For surfaces that will be unexposed in the finished structure, form concrete with plywood, lumber, metal, or other material acceptable to the Architect. If lumber is used, it shall be dressed on at least two edges and one side for tight fit.
- C. Automatic machine placement shall be used for curb placement. Submit revised mix design and laboratory test results that meet or exceed requirements for outdoor concrete. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete.

### 2.02 REINFORCING MATERIALS:

- A. Reinforcing Bar: ASTM A615, Grade 60.
- B. Welded Wire Fabric: ASTM A185, welded steel wire fabric.
- C. Supports for Reinforcement: Provide supports for reinforcement, including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Unless otherwise indicated on the drawings, use wire type bar supports complying with CRSI recommendations, concrete brick. Wood, construction debris, and other organic material will not be acceptable. Comply with the following:
  1. For slabs on grade, where wetted base material will not support chair legs, use supports with sand plates or horizontal runners.

2. Mesh-Ups wire mesh supports as manufactured by John L. Lowery & Associates, Inc., 9348 South Choctaw Drive, Baton Rouge, LA 70815. Phone: 800-535-8375
3. For concrete surfaces exposed to view, where leg supports are in contact with forms, provide supports with legs that are hot dip galvanized or protected by either plastic or stainless steel.

## 2.03 CONCRETE MATERIALS:

- A. Portland Cement: ASTM C150, Type I. Use only one brand of cement throughout the project, unless otherwise acceptable to the Architect.
- B. Normal Weight Aggregates: ASTM C33, or local aggregates that do not comply with ASTM C33, but that have been shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Architect.
- C. Fine aggregate: Clean, sharp, natural sand or crushed gravel when used for vehicular wearing surfaces. Manufactured sand may be used elsewhere provided the percentage passing a No. 200 sieve is less than 3%.
- D. Coarse Aggregate: Crushed stone conforming to ASTM C 33 standard specification for concrete aggregates that is clean, uncoated, and processed from natural rock or stone and that contains no clay, mud, loam, or foreign matter.
- E. Combined aggregate gradation for slabs and other designated concrete shall be 8% - 18% for large top size aggregates (1½ in.) or 8% - 22% for smaller top size aggregates (1 in. or ¾ in.) retained on each sieve below the top size and above the No. 100.
- F. Vapor Barrier: The vapor barrier shall be placed over prepared base material where indicated below slabs on grade. Vapor barrier shall be no less than 10 mil thick in accordance with ACI 302.1R
  1. Provide vapor barrier which conforms to ASTM E1745, Class B or higher unless noted otherwise. The membrane shall have a water-vapor permeance rate no greater than 0.3 perms when tested in accordance with ASTM E154, Section 11, a minimum tensile strength of 30 lb./in. when tested in accordance with ASTM E 154, Section 9 and a Resistance to Puncture of 1700 grams in accordance with ASTM E 154 Section 10 (ASTM D1709 Method B).
    - a. Class B Vapor Barriers: Available Product: Subject to compliance with requirements, products that may be incorporated into the Work includes, but are not limited to, Stego Wrap 15 mil) Vapor Barrier by Stego Industries LLC, Griffolyn 15 mil by Reef Industries, Perminator® 15 Mil by W. R. Meadows, or Viper.® Vaporcheck 15 mil by Insulation Solutions, Inc..
- G. Water: clean, fresh, drinkable.
- H. Admixtures:
  1. Water Reducing Admixture: Conforming to ASTM C494, Type A, Eucon WR-75, WR-91 or MR by the Euclid Chemical Company, Pozzolith 322N or Polyheed 997 by Master Builders, or Plastocrete 161 by Sika Chemical Corporation.
  2. Water Reducing, Retarding Admixture: Conforming to ASTM C494, Type D, Eucon Retarder - 75 by the Euclid Chemical Company, Pozzolith 100XR Master Builders, Plastiment by Sika Chemical Corporation, or Daratard - 17 by WR Grace and Co.
  3. High Range Water Reducing Admixture: Conforming to ASTM C494, Type F or G, (Superplasticizer): Eucon 37, 1037 or Plastol 5000 by the Euclid Chemical Company or Rheobuild 1000 or 716 by Master Builders Inc.
  4. Non-chloride Accelerator: Accelguard 80 by the Euclid Chemical Company of Darex Set Accelerator by W.R. Grace.



5. Air Entraining Admixture: ASTM C260.
6. Pozzolanic Admixtures: ASTM C618.
7. Prohibited Admixtures: Calcium Chloride or admixtures containing more than 0.05% Chloride Ions are not permitted.

I. Supplementary Cementitious Materials:

1. Fly Ash: ASTM C618, Type F: Ignition loss shall not exceed three (3) percent. Only one source of fly ash shall be used.
2. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120.
3. Fly ash shall be used at a maximum percentage rate of 25% of Portland Cement by weight and blast furnace slag at a maximum percentage rate of 40% of Portland Cement by weight. The exact amount selected shall be based on a successful test placement.

2.04 RELATED MATERIALS:

A. Mineral Aggregate Base: Open graded stone conforming to ASTM No. 57

Sieve Size , Grading D	Total Percent by Weight, Passing Sieves
1-1/2 in. (37.5 mm)	100
1 in. (25 mm)	95-100
1/2 in. (12.5 mm)	50-80
No. 4 (4.75 mm)	0-10
No. 8 (2.36 mm)	0-5

B. Waterstops shall be Vynlex RB6316H preformed PVC ribbed waterstop by Vynlex Corporation, Knoxville, Tennessee or Greenstreak or Paul Murphy Plastics Co.

C. Joint Filler: Provide preformed joint filler at slab expansion joints, joints between floor slabs and walls and other isolation joints. Provide one of the following:

Precompressed, impregnated open cell foam.

Asphalt saturated fiberboard complying with ASTM D 1751

Granulated cork between saturated felt or glass fiber felt complying with ASTM D 1752 Type H.

D. Curing Compounds:

1. Curing and Sealing Compound (VOC Compliant, 700 g/l): Liquid type membrane-forming curing compound, clear styrene acrylate type, complying with ASTM C1315, Type I, Class B, 25% solids content minimum. Moisture loss shall be not more than 0.30 Kg/m<sup>2</sup> when applied at 300sf/gal. Manufacturer's certification is required. Subject to project requirements provide one of the following products: "Super Rez Seal" by The Euclid Chemical Company or Seal-Cure 309-25 by W.R. Meadows.

Or

2. Clear Curing and Sealing Compound (VOC Compliant, 350 g/l): Liquid type membrane-forming curing compound, clear styrene acrylate type, complying with ASTM C1315, Type I, Class A, 25% solids content minimum. Moisture loss shall be not more than 0.40 Kg/m<sup>2</sup> when applied at 300sf/gal. Manufacturer's certification is required. Subject to project requirements provide one of the following products: "Super Diamond Clear VOX" or Super Rez Seal VOX" by The Euclid Chemical Company.
3. Curing Compound (Strippable for use on slabs to receive direct applied finishes): The curing compound shall conform to ASTM C309. Provide "Kurez DR VOX" by The Euclid Chemical Company or 1100 Clear Series by W. R. Meadows.

- E. Bonding Compound: Euco Weld by Euclid Chemical Company or Weldcrete by the Larsen Company. The compound shall be polyvinyl acetate, rewettable type. Do not use in areas subject to moisture.
- F. Epoxy Adhesive: Euco Epoxy No. 452 or 620 by Euclid Chemical Company or Sikadur Hi-Mod by Sika Chemical Corporation. The compound shall be a 2 component, 100% solids, 100% reactive compound suitable for use on dry or damp surfaces.
- G. Non-shrink Grout: Euco NS by the Euclid Chemical Company or and Masterflow 713 by Master Builders. The grout shall conform to CRD-C621-80, "Corps of Engineers Specification for Non-shrink Grout".
- H. High Flow Grout: Where high fluidity and/or increased placing time is required, use high flow grout. The factory pre-mixed grout shall conform to ASTM C1107, "Standard Specification for Packages Dry, Hydraulic-Cement Grout (Non-Shrink)." In addition, the grout manufacturer shall furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95% bearing under a 18" x 36" base plate. Provide "Hi-Flow Grout" by The Euclid Chemical Co.
- I. Non-Oxidizing Metallic Hardener: The specified non-oxidizing metallic floor hardener shall be formulated, processed and packaged under stringent quality control at the manufacturer's owned and controlled factory. The hardener shall be a mixture of specially processed non-rusting aggregate, selected Portland cement and necessary plasticizing agents. Product shall be "Diamond-Plate" by The Euclid Chemical Co.
- J. Mineral Aggregate Hardener: The specified mineral aggregate hardener shall be formulated, processed and packaged under stringent quality control at the manufacturer's owned and controlled factory. The hardener shall be a factory-blended mixture of specially processed graded mineral aggregate, selected Portland cement and necessary plasticizing agents. Product shall be "Surflex" by The Euclid Chemical Co. or "Mastercron" by Master Builders.
- K. Liquid Densifier/Sealer: The liquid densifier compound shall be a silicate based sealer which penetrates concrete surfaces, increases abrasion resistance and provides a "low-sheen" surface that is easy to clean and eases the problem of tire mark removal. Product shall have a minimum solids content of 20% of which 50% must be silicate. Provide "Diamond Hard" by The Euclid Chemical Company.
- L. One Part Repair Topping: Latex and microsilica modified cementitious mortar designed for use as a floor or deck topping at thicknesses of 1/16" to 3/8". Product shall be "Thin-Top Supreme" by The Euclid Chemical Co. For thicknesses up to 2", product shall be "Concrete-Top Supreme" by The Euclid Chemical Co.
- M. Underlayment Compound: Free-flowing, self-leveling, pumpable cementitious base compound, "Super Flo-Top" by The Euclid Chemical Co. The compound shall exhibit the following properties:

Compressive Strength (ASTM C109)	- 4400 PSI @ 7 days - 5000 PSI @ 28 days
Bond Strength (ASTM C1042)	- 700 PSI @ 7 days - 1000 PSI @ 28 days

## 2.05 MISCELLANEOUS MATERIALS:

- A. Fill concrete spandrel blocks with concrete and reinforce with two (2) No. 4 bars to form cap beams at top of all masonry walls unless noted otherwise.
- B. Fill steel pan stair risers and landings with non-slip concrete, poured in place and reinforced with 2" diamond mesh lath or fiber mesh. The fill shall consist by volume of 1 part Portland cement, 1-1/2 parts sand and 3 parts pea gravel. Fill shall have a smooth steel trowel finish.

- C. Provide 2'-6" x 2'-6" corner bars of same size and number as footing reinforcing in all foundation corners unless noted otherwise.
- D. Concrete slabs on grade at dumpster pads and equipment pads shall be 6 inch concrete reinforced with WWF 6 x 6 – W2.9 x W2.9 over 4 inches of crushed stone unless noted otherwise on the drawings.
- E. Provide and install 16 inch by 30 inch precast concrete splash blocks as manufactured by Southern Cast Stone at all downspouts that empty on grade.

## 2.06 MIX DESIGN:

### A. Preparation

- 1. Prepare design mixes for each type and strength of concrete in accordance with ACI 318, "Building Code Requirements for Structural Concrete," Section 5.3 and with applicable provisions of ASTM C94. Submit written reports of each proposed mix for each class of concrete on the Mix Design Submittal Form included at the end of this specification at least 15 days before the start of work.
- 2. Provide special mix design for use with automatic machine placement of curbs.
- 3. The design mix shall provide normal weight concrete with 28 day compressive strength as indicated on the drawings or as shown below if not otherwise indicated.

### B. Admixtures

- 1. All concrete shall contain the specified water reducing admixture or high-range water-reducing admixture. All concrete slabs placed at air temperatures below 50° F shall contain the specified non-chloride accelerator. All concrete required to be air entrained shall contain an approved air entraining mixture. All pumped concrete and concrete with a W/cm of less than 0.50 shall contain the specified high-range water-reducing admixture.
  - a. Use an air entraining admixture in all concrete structures and slabs exposed to freezing and thawing or subjected to hydrostatic pressure:
    - 2.5% to 5.5% for maximum 2 inches aggregate
    - 4.5% to 7.5% for maximum 3/4 inch aggregate
    - 5.5% to 8.5% for maximum 1/2 inch aggregate
  - b. All trowel finished interior slabs: Maximum air content of 3% (do not add air entraining admixture).
- 2. Water/Cement Ratio: All concrete exposed to freezing and thawing shall have a maximum water/cement ratio of 0.50. All concrete subjected to deicers and/or required to be watertight shall have a maximum water/cement ratio of 0.45. All reinforced concrete, subjected to deicers, brackish water or salt spray shall have a maximum water/cement ratio of 0.40. All other concrete shall have a maximum water/cement ratio of 0.58.
- 3. Use the amounts of admixtures recommended by the manufacturer for climatic conditions prevailing at the time of placing. Adjust quantities and types of admixtures as required to maintain quality control.

## 2.07 SELECTION OF PROPORTIONS:

### A. General:

Concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, water, admixtures, and as specified, Air Entraining Admixture. Proportions of ingredients shall produce concrete that will work readily into corners and angles of forms, bond to reinforcement, without segregation or excessive bleed water forming on the surface. Proportions of materials shall be in

accordance with ACI 211.1, "Recommended Practice for Selecting Proportions for Normal, Heavy and Mass Weight Concrete."

1. Proportions of ingredients shall be selected by past field experience or, in lieu of past performance, laboratory trial mixes to produce placeability, durability, specified strength and properties specified.

B. Required Average Strength Above Specified Strength:

Determinations of required average strength ( $f'c$ ) shall be in accordance with ACI 318, "Building Code Requirements for Reinforced Concrete," and evaluations of compressive strength results of field concrete shall be in accordance with ACI 214, "Recommended Practice for Evaluation of Strength Test Results of Concrete."

1. Past Field Experience - Proportions shall be established on the actual field experience of the ready-mix producer with the materials proposed to be employed. Standard deviations shall be determined by 30 consecutive tests (or two groups of tests totaling 30 or more).

- a. Average strength ( $f'c$ ) shall exceed specified strength ( $f'c$ ) by at least:

400 psi (2.8 MPa)	-	standard deviation is less than 300
550 psi (3.8 MPa)	-	standard deviation is 300 to 400
700 psi (4.8 MPa)	-	standard deviation is 400 to 500
900 psi (6.2 MPa)	-	standard deviation is 500 to 600
1200 psi (8.3 MPa)	-	standard deviation is above 600 or unknown

2. Trial Mixes - When the ready-mix producer does not have a record of past performance, the combination of materials and the proportions selected shall be selected from trial mixes having proportions and consistencies suitable for the work based on ACI 211.1-91, using at least three different water-cement ratios which will produce a range of strengths encompassing those required.

- a. Average strength ( $f'c$ ) required shall be:

Specified compressive strength	--	Required average compressive strength
Less than 3000 ( $f'c$ psi)	--	$f'c + 1000$ ( $f'c$ psi)
3000 to 5000 ( $f'c$ psi)	--	$f'c + 1200$ ( $f'c$ psi)
Over 5000 ( $f'c$ psi)	--	$f'c + 1400$ ( $f'c$ psi)

2.08 CONCRETE QUALITIES REQUIRED:

A. Specified Compressive Strength:

Specified Compressive ( $f'c$ ) Strength @ 28 days, unless noted higher on the drawings, shall be:

3000 psi (21 MPa) – Interior floor slabs with applied finishes and footings.  
3500 psi (24 MPa) – Steel troweled interior slabs subjected to vehicular traffic.  
4000 psi (28 MPa) – Walks, curbs, columns, beams and other concrete exposed to the weather.

B. Slump:

1. Consolidation by vibration, 3 in. (76 mm) not to exceed 4 in. (102 mm).
2. Consolidation by other methods, 4 in. (102 mm) not to exceed 5 in. (127 mm).
3. Placement and consolidation by automatic machine: Slump as required by mix design.
  - a. All concrete containing the high-range water-reducing admixture (superplasticizer) shall have a maximum slump of 9" unless otherwise approved

by the Architect. The concrete shall arrive at job site at a slump of 2" to 3", (3" to 4" for concrete receiving a "shake-on" hardener or lightweight concrete), be verified, then the high-range water-reducing admixture added to increase slump to the approved level. All other concrete shall have a maximum slump of 4."

- b. Slump shall be determined by ASTM C 143-78, "Standard Test Method for Slump of Portland Cement Concrete."
- C. "Quick Dry" Concrete: Maximum W/cm – 0.40, superplasticized, 3% maximum air content. The floor finish shall be as required by the manufacturer of the specified floor coating or covering.
- D. Aggregate Size: Maximum size of coarse aggregate shall not exceed:
  - 1. One-fifth narrowest dimension between forms.
  - 2. Three-fourths minimum clear spacing between reinforcing bars.
  - 3. One-third the thickness of slabs.

#### 2.09 CONCRETE CLEANERS:

- A. Citrus based industrial degreaser and detergent. Acceptable products include:
  - 1. AC-4450 ORANGE NATURAL 20 CONCENTRATE as distributed by Interstate Products Inc. 800-474-7294
  - 2. Commercial Strength Contractor's Solvent as manufactured by Orange-Sol Industrial Products Inc. 800-279-8822
  - 3. De-Solv-It Heavy Duty 24 as manufactured by Orange-Sol Industrial Products Inc. 800-279-8822

### 3PART III EXECUTION

#### 3.01 PRE-CONCRETE CONFERENCE:

- A. At least 35 days prior to the start of the concrete construction schedule, the contractor shall conduct a meeting to review the proposed mix designs and to discuss the required methods and procedures necessary to achieve the required concrete quality. The contractor shall send a pre-concrete conference agenda to all attendees 20 days prior to the scheduled date of the conference.

#### 3.02 PREPARATION FOR SLABS ON GRADE:

- A. Subgrade: Before any base material is installed, compact the subgrade of the area to be paved to 100% of optimum density as determined by ASTM D698 (Standard Proctor).
- B. Base: Install a mineral aggregate base of the type specified above in accordance with Section 303 of the TDOT specifications.
- C. The base must not depress more than 1/2" under a fully loaded ready-mix concrete truck.

#### 3.03 FORMWORK:

- A. Design, construct, erect, brace, and maintain formwork according to ACI 301.
- B. Use metal form ties that are factory made, adjustable in length, designed to prevent form deflection, and either removable or snap-off and that will prevent the concrete surface's being spalled when the ties are removed. If snap-off ties are used, the portion remaining within the concrete after removal must be at least 1-1/2 inches inside the concrete unless the drawings indicate otherwise.

C. Provide openings in concrete formwork to accommodate the work of other trades. Determine the size and location of openings, recesses, and chases from the trades providing such work. Accurately place and securely support items built into forms.

D. Clean thoroughly forms and adjacent surfaces that are to receive concrete. Remove chips, wood, sawdust, dirt, and any other debris just before the concrete is placed. After concrete placement, retighten forms if necessary to eliminate mortar leaks.

3.04 PLACING VAPOR BARRIER:

A. Arrange layout of vapor barrier to minimize seams and penetrations.

B. Unroll vapor barrier over compacted aggregate base.

C. Overlap all seams a minimum of six inches and seal with tape.

D. All penetrations must be sealed using a combination of seam tape and mastic in accordance with manufacturer's latest printed instructions.

E. Turn vapor barrier up at edge of slab to masonry wall juncture to provide bond break.

3.05 PLACING REINFORCEMENT:

A. For details and methods of placing reinforcement and supports, comply with the specified codes and standards, the recommended practice of the CRSI as outlined in "Placing Reinforcing Bars," and these specifications.

3.06 INSTALLATION OF WATERSTOPS:

A. Provide continuous waterstops and install waterstops in concrete joints where indicated.

B. Carry waterstops in walls into lower slabs and join to waterstops in slabs with appropriate fittings.

C. In water bearing structures, provide all joints with waterstops whether indicated on the drawings or not.

D. Secure waterstops accurately to position and line as indicated on the drawings using factory installed hog rings or factory pre-punched holes in the outermost rib with tie wire. Do not drive nails, screws, or other fasteners through the waterstop at any time at any location.

E. Secure at intervals of not more than 15 inches to prevent movement during the pour of concrete.

F. Terminate waterstops 3 inches from the top of finished surfaces of walls and slabs, unless otherwise specified on the drawings.

3.07 CONCRETE PLACEMENT:

A. Before placing concrete, inspect and complete the formwork installation, reinforcing steel, and items to be embedded or cast in.

B. Use mechanical vibrating equipment, including a laser screed, supplemented by hand spading, rodding, or tamping to consolidate placed concrete. The equipment and procedures used to consolidate the concrete shall comply with the recommended practices of ACI 309 and suit both the type of concrete and project conditions.

C. Until the placing of a panel or section is completed, deposit and consolidate concrete slabs in a continuous operation within construction joints.

D. Consolidate concrete during placing operations so that it is thoroughly worked around reinforcement and other embedded items and into corners.

- E. Bring slab surfaces to the correct level with a straightedge and strike off. Use highway bull floats or straightedges to smooth the surface, leaving it free from humps and hollows. Do not sprinkle water on the plastic surface. Do not disturb the slab surfaces before starting finishing operations.
- F. Maintain reinforcement in the proper position during placement operations.
- G. Cold Weather Placement:
  - 1. Comply with ACI 306 and the requirements herein specified to protect concrete work from physical damage or reduced strength due to frost, freezing, or low temperatures.
- H. Hot Weather Placement:
  - 1. When the weather is hot enough to impair seriously the concrete's quality and strength, place the concrete as specified herein and in ACI 305.

### 3.08 JOINTS:

- A. Locate and install construction joints (which are not shown on the drawings) as approved by the Architect so that the strength and appearance of the structure will not be impaired.
- B. Provide keyways at least 1-1/2 inches deep in construction joints that are in walls and slabs or between walls and footings. Bulkheads designed for this purpose may be used if accepted by the Architect. Construction joints, in slabs subjected to vehicular traffic, shall have round, square or diamond dowels as indicated on the drawings.
- C. Place construction joints perpendicular to the main reinforcement. Continue all reinforcement across construction joints of structural members.
- D. Construct isolation joints in slabs on the ground wherever there is contact between slabs on the ground and vertical surfaces and wherever else indicated on the Drawings.
- E. Contraction (control) joints in slabs on ground as shown on the Drawings shall have a maximum spacing of 36 times slab thickness each way if not shown otherwise.
- F. Saw-Cut Control Joints:
  - 1. Primary Method: Soff-Cut System method, by Soff-Cut International, Corona, CA (800)776-3328. Finisher must have documented successful experience in the use of this method prior to this project. Install cuts within 2 hours after final finish at each saw cut location. Use 1/8 inch thick blade, cutting 1-1/4 inch into slab.
  - 2. Optional Method (Where Soff-Cut System Method Equipment is Not Available): Properly time cutting with the set of the concrete. Saw-cut control joints within 12 hours after finishing. Start cutting as soon as the concrete has hardened sufficiently to prevent aggregates being dislodged by the saw. Complete cutting before shrinkage stresses become sufficient to produce cracking. Use 1/4 inch thick blade, cutting 1/4 slab depth.

### 3.09 FINISH OF FORMED SURFACES:

- A. Finishes to be in accordance with ACI 301.
- B. Trowel Finish: Apply a trowel finish to all interior slab surfaces unless otherwise noted on the drawings. The concrete shall be placed, consolidated, struck-off and leveled to the proper elevation using a laser screed, or vibratory screed. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Cut down high spots and fill low spots with highway straightedge. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform,

smooth, granular texture. Surface shall achieve an F(F) 20 – F(L) 17 tolerance. The surface shall then be troweled, at least twice, to a smooth dense finish, free of trowel marks, uniform in texture and appearance, and achieves a tolerance of F(F) 25 (floor flatness) and F(L) 20 (floor levelness) minimum overall composite and F(F) 17 and F(L) 15 minimum at any individual section measured according to ASTM E 1155. Grind smooth any surface defects that would telegraph through the applied floor covering or repair as necessary with the specified repair compound or underlayment to achieve the specified tolerance.

- C. Non-Oxidizing Metallic Floor Hardener: All slabs, in the loading dock area and other areas noted on the drawings, shall receive an application of the non-oxidizing, metallic floor hardener applied at the rate of 1.5 lbs/ft<sup>2</sup>. Immediately following the first floating operation, uniformly distribute approximately 2/3 of the required weight of the non-oxidizing metallic floor hardener over the concrete surface, by mechanical spreader, and embed by means of power floating. The hardener shall be floated in and the second application made. The surface shall be floated again to properly bond the hardener to the base concrete slab. The surface shall then be troweled, at least twice, to a smooth dense finish.
- D. Mineral Aggregate Hardener: All slabs, in areas noted on the drawings, shall receive an application of the mineral aggregate hardener applied at the rate of 1.2 lbs/ft<sup>2</sup>. The hardener shall be applied in two applications by mechanical spreader. The first shake shall comprise 2/3 of the specified amount of hardener. This application shall be made after the initial floating operation unless climatic conditions dictate earlier application. The hardener shall be floated in and the second application made. The surface shall be floated again to properly bond the hardener to the base concrete slab. The surface shall then be troweled, at least twice, to a smooth, dense finish.
- E. Non-slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps, and ramps and elsewhere as indicated by the drawings or schedules. Texture shall be as approved by Architect from sample panels.
- F. Liquid Densifier/Sealer Finish: Apply this compound on exposed interior floors subjected to vehicular abrasion and shake on hardener slabs as indicated on the drawings. Application shall be made in strict accordance with the directions of the manufacturer and just prior to completion of construction. Spray, squeegee or roll on liquid densifier to clean, dry concrete surface. The liquid should be scrubbed into the surface with a mechanical scrubber. Keep the surface wet with the densifier during the application process. When the product thickens, but not more than 60 minutes after initial application, the surface shall then be squeegeed or vacuumed to remove all excess liquid
- G. Sealer/Dustproofer Finish: Apply a second coat of the specified curing and sealing compound to interior concrete floors where shown on the drawings or in schedules to be sealed concrete. The compound shall be applied in strict accordance with the directions of the manufacturers and just prior to completion of construction.

Note to Contractor: Paint game lines on Gymnasium floor prior to applying second coat of sealing compound.

### 3.10 CURING:

- A. After placing and finishing the concrete, start initial curing as soon as free water has disappeared from concrete surface. Keep continuously moist for not less than 7 days and above 50° F. When high early strength concrete is used, the temperature requirement may be reduced to three days.
- B. Begin final curing immediately after initial curing and before the concrete has dried. Continue final curing in accordance with ACI 301. Avoid rapid drying at the end of the final curing period.
- C. All exposed interior slabs, not receiving a liquid densifier, and troweled slabs receiving mastic applied adhesives or “shake-on” hardeners shall be cured with the specified curing and sealing compound. Exterior slabs, sidewalks, curbs, and architectural concrete, not receiving a



penetrating sealer, shall be cured with the specified clear, non-yellowing curing and sealing compound. Maximum coverage shall be 400 ft<sup>2</sup>/gallon on steel troweled surfaces and 300 ft<sup>2</sup>/gallon on floated or broomed surfaces for the curing/sealing compound.

- D. Curing Compound (Strippable): Use the specified strippable curing compound on surfaces to be covered with finish or coating material applied directly to concrete, such as liquid densifier/sealer, waterproofing, dampproofing, membrane roofing, flooring, painting, and other coatings and finish materials. Apply in accordance with manufacturer's instructions.

### 3.11 MISCELLANEOUS CONCRETE ITEMS:

- A. Filling In: Unless the drawings show otherwise or the Architect directs, fill in holes and openings left in concrete structures for the work of other trades once that work is in place. Mix, place, and cure concrete as specified herein to blend with in-place construction. Provide other miscellaneous concrete filling shown on the drawings or necessary to complete the work.
- B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on the drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with the certified diagrams or templates of the manufacturer furnishing the machines and equipment.
- C. Nonshrink Grout: Grout base plates and foundations as indicated using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.

Where high fluidity and/or increased placing time is required use the specified high flow grout. This grout shall be used for all base plates larger than 10 square feet.

### 3.12 EVALUATION AND ACCEPTANCE:

- A. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.
- B. Cracks which affect structural integrity:
  - 1. No crack will be accepted
  - 2. Affected areas to be removed and replaced
  - 3. Submit repair plan to structural engineer for approval before beginning repairs
- C. Cracks which do not affect structural integrity:
  - 1. Cracks consistently greater than 1/4" in width will not be accepted, remove and replace section to nearest existing joint.
  - 2. Cracks showing vertical separation of plane will not be accepted remove and replace section to nearest existing joint.
  - 3. Cracks less than 1/4" in width, occurring in appearance sensitive areas (i.e. front entry, front sidewalk, etc.), may require replacement. Final decision resides with the Owner.
  - 4. Cracks less than a 1/4" in width in non-appearance sensitive areas will be filled with Bonsal vinyl concrete repair compound, or approved equal, following manufacturer's recommended application procedures.

### 3.13 WALKS AND CURBS:

- A. Walks and sidewalks shall be not less than 4" thick, placed over a 4" layer of porous fill as specified, and marked off with surface joints at 6'-0" o.c. as shown. Install expansion joints between walks and building, at changes in walk direction, at 30'-0" o.c., and elsewhere as shown. Expansion joints shall be formed with 1/2" thick preformed filler.

- B. Curbs shall be constructed to size and profile shown, placed over binder course of paving. Provide expansion joints at 50 feet on center maximum.
- C. All edges, joints and margins shall be straight and true and rounded with jointing and edging tools.
- D. Walks shall be sloped 1/4" per foot.

3.14 REPAIR OF DEFECTIVE AREAS

- A. With prior approval of the Engineer, as to method and procedure, all repairs of defective areas shall conform to ACI 301, Section 5.3.7, except that the specified bonding compound must be used.
- B. Leveling of floors for subsequent finishes shall be achieved by use of the specified underlayment material.
- C. All exposed floors shall be leveled, where required, with the specified self-leveling repair topping.
- D. Repair methods not specified above may be used, subject to acceptance of Engineer.

3.15 CLEANING AND PROTECTION:

- A. Protect corners, edges, and surfaces of cast-in-place architectural concrete from damage; use guards and barricades.
- B. Protect cast-in-place architectural concrete from staining, laitance, and contamination during remainder of construction period.
- C. Clean cast-in-place architectural concrete surfaces after finish treatment to remove stains, markings, dust, and debris. Use power washer set to low pressure (800 psi maximum) with orange cleaner/degreaser to clean all exposed exterior concrete.
- D. Wash and rinse surfaces according to concrete finish applicator's recommendations and cleaning solutions written instructions. Protect other Work from staining or damage due to cleaning operations.
- E. Do not use cleaning materials or processes that could change the appearance of cast-in-place architectural concrete finishes.

End of Section

## CONCRETE MIX DESIGN SUBMITTAL FORM

Project: \_\_\_\_\_  
City: \_\_\_\_\_  
General Contractor: \_\_\_\_\_  
Concrete Contractor: \_\_\_\_\_  
Concrete Strength (Class): \_\_\_\_\_  
Use (describe): \_\_\_\_\_

### Design Mix Information

Based on Standard Deviation Analysis ☐ Please check one  
Trial Mix Test Data ☐

### Design Characteristics:

Density  pcf  
Strength  psi (28 day)  
Air  % specified

*If trial mixes are used the Mix Design is proportioned to achieve  $f'_{cr} = f'_c + 1200$  psi  
(1400 psi for strength higher than 5000 psi at 28 days)*

<u>MATERIALS</u>	Type/ Source	Specific Gravity	Weight/lb.	Absolute Vol. cu.ft.
Cement				
Flyash				
Microsilica				
Coarse Aggregate				
Fine Aggregate				
Water				
Air				
Other				
TOTAL				27.0 cu. ft.

\* Water/Cement Ratio (lbs. water/lbs. cement) = \_\_\_\_\_ %

<u>ADMIXTURES</u>	Manufacturer	Dosage oz/cwt
Water Reducer		
Air Entraining Agent		
High Range Water Reducer		
Non-Corrosive Accelerator		
Other		

Slump before HRWR \_\_\_\_\_ inches  
Slump after HRWR \_\_\_\_\_ inches

## Standard Deviation Analysis (from experience records):

# of Test Cylinders Evaluated:	
Standard Deviation:	

$$f'_{cr} = f'_c + 1.34s \text{ or } f'_{cr} = f'_c + 2.33s - 500$$

(Refer to ACI 301 for increased deviation factor when less than 30 tests are available)

## LABORATORY TEST DATA

### Compressive Strength

Age (days)	Mix # 1	Mix #2	Mix #3
7	psi	psi	psi
7	psi	psi	psi
28	psi	psi	psi
28	psi	psi	psi
28 average	psi	psi	psi

## REQUIRED ATTACHMENTS:

Coarse Aggregate Gradation Report

Fine Aggregate Gradation Report

Concrete Compressive Strength Data or Trial Mixture Test Data

Admixture Compatibility certification letter

Please Check


## Submitted by:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Phone #: \_\_\_\_\_

Main Plant Location: \_\_\_\_\_

Miles from Project: \_\_\_\_\_

Secondary Plant Location: \_\_\_\_\_

Miles from Project: \_\_\_\_\_

Date: \_\_\_\_\_

## SECTION 03 55 00 – CEMENTITIOUS FLOOR UNDERLAYMENT

### 1PART 1 GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials and equipment, and perform all work required to install cementitious floor underlayment as shown on the drawings, including all necessary incidental work in connection therewith.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 QUALITY ASSURANCE:

- A. Installer's qualifications: Installation of cementitious floor underlayment shall be by an applicator authorized by the manufacturer.
- B. Installation shall be accomplished using equipment approved by the manufacturer of the underlayment.

#### 1.04 SUBMITTALS:

- A. Submit manufacturer's product data for each type of product, and accessory, including certifications that each type complies with specified requirements.
- B. Submit copies of manufacturer's certification of installer and equipment to be utilized.

#### 1.05 DELIVERY, STORAGE AND HANDLING:

- A. Materials shall be delivered in their original, unopened packages, and be protected from exposure to the elements. Damaged or deteriorated materials shall be removed promptly from the premises and not incorporated into the work.
- B. Store cementitious materials above ground, under cover and in dry enclosure.

#### 1.06 SITE CONDITIONS:

- A. Environmental Requirements: Before, during and after installation of floor underlayment, building interior shall be enclosed and maintained at a temperature above 50° F.

### 2PART 2 PRODUCTS

#### 2.01 MATERIALS:

- A. Gypsum Cement Floor Underlayment:

Gyp-Crete 2000 floor Underlayment for wood frame commercial construction as manufactured by Maxxon Corporation,  
920 Hamel Road Hamel, MN 55340  
Phone: 1-800-356-7887 or (763)478-9600  
Fax: (763) 478-2431  
<http://www.maxxon.com>.

or approved substitute.

Ultraplan® 1as manufactured by

MAPEI Corporation  
1144 East Newport Center Drive  
Deerfield Beach, FL 33442  
Phone: (800) 42-MAPEI  
Fax: (954) 246-8800 E-mail:  
<http://www.mapei.com>

- B. Sand Aggregate: Sand shall be 1/8 inch or less, washed masonry or plaster sand, meeting requirements of Maxxon Corporation Sand Specification 101.
- C. Mix Water: Potable, free from impurities.
- D. Subfloor Primer: Maxxon Floor Primer.
- E. Sound Control Mat: Maxxon Acousti-Mat 1
- F. Sealer: Maxxon Overspray.
- G. Gypsum Cement Set-Time Accelerator: Maxxon Set Modifier.

## 2.02 MIX DESIGN:

- A. General Requirements: Mix proportions and methods shall be in strict accordance with product manufacturer recommendations.
- B. Mix design available for new and renovated light commercial and commercial projects over wood subfloors.

## 3PART 3 EXECUTION

### 3.01 PREPARATION:

- A. Condition and cleaning of subfloor: Subfloor shall be structurally sound, Contractor shall clean subfloor to remove mud, oil, grease, and other contaminating factors.
- B. Leak Prevention: Fill cracks and voids with a quick-setting patching or caulking material where leakage of underlayment could occur.
- C. Priming Subfloor: Prime the subfloor using the manufacturer's recommended primer. Priming instructions may vary according to the porosity of the substrate; multiple coats may be necessary.

### 3.02 APPLICATION OF CEMENTITIOUS FLOORING:

- A. Scheduling: Application of underlayment shall not begin until the building is enclosed, including roof, windows, doors, and other fenestration. Install after drywall installation.
- B. Application: Place Gyp-Crete 2000 at 3/4 inch over wood frame. Spread and screed Gyp-Crete 2000 to a smooth surface. Except at authorized joints, place underlayment as continuously as possible until application is complete so that no product slurry is placed against product that has obtained its initial set.
- C. C Drying: Contractor shall provide continuous ventilation and adequate heat to rapidly remove moisture from the area until the underlayment is dry. Contractor shall provide mechanical ventilation if necessary. Under the above conditions, for 3/4 inch thick underlayment, 5-7 days is usually adequate drying time. To test for dryness, tape a 24" by 24" section of plastic to the surface of the underlayment. After 48-72 hours, if no condensation occurs, the underlayment shall be considered dry. Perform dryness test 5-7 days after pour.

### 3.03 PREPARATION FOR INSTALLATION OF GLUE-DOWN FLOOR GOODS:

- A. Sealing: Seal all areas that receive glue-down floor goods according to Maxxon Corporation specifications. Any floor areas where the surface has been damaged shall be cleaned and sealed regardless of floor covering to be used. Use Maxxon Overspray to seal the underlayment prior to the installation of glue-down floor goods. Where floor goods manufacturers require special adhesive or installation systems, their requirements shall supersede these recommendations.

3.04 FIELD QUALITY CONTROL:

- A. Slump Test: Underlayment mix shall be tested for slump as its being primed using a 2 inch by 4 inch cylinder resulting in a patty size of 8 inches plus or minus 1 inch in diameter.
- B. Field Samples: At least one set of 3 molded cube samples shall be taken from each day's pour during the underlayment application. Cubes shall be tested as recommended by Maxxon Corporation in accordance with ASTM C472. Test results shall be available to the Architect and Contractor upon request.

3.05 PROTECTION:

- A. Protection from heavy loads during construction: Place temporary wood planking over underlayment wherever it will be subject to heavy wheeled or concentrated loads.

End of Section

## SECTION 04 20 00 – UNIT MASONRY

### PART 1 GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials and equipment, and perform all work required to install masonry work as shown on the drawings, including concrete block, precast masonry lintels, and all necessary incidental work in connection therewith.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 QUALITY ASSURANCE:

- A. Qualifications of workmen:
  - 1. For the actual cutting and placing of concrete masonry units, use only skilled journeyman masons who are thoroughly experienced with the materials and methods specified and thoroughly familiar with the design requirements.
  - 2. In acceptance or rejection of installed concrete masonry units, no allowance will be made for lack of skill on the part of workman.
  - 3. Provide at least one (1) skilled journeyman mason who shall be present at all times during execution of the work of this Section and who shall personally direct the execution of this portion of the work.
- B. Masonry units exposed to view shall be obtained from a single manufacturer; each type of product shall be from a single batch or production run.
- C. Cementitious ingredients of mortar mix shall be obtained from a single manufacturer. Each aggregate for mortar mix shall be obtained from a single source.
- D. Comply with applicable portions of the American Society for Testing and Materials (ASTM) Applicable codes and regulations of authorities having jurisdiction.

#### 1.04 SUBMITTALS:

- A. Submit manufacturer's product data for each type of masonry unit, accessory and other manufactured products, including certifications that each type complies with specified requirements.
- B. Submit certification by recognized testing laboratory that fire rated CMU products conform to the requirements for the various ratings required.

#### 1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver masonry materials in undamaged condition. Handle masonry units to prevent damage. Store in a manner to protect against excessive moisture, temperature changes, contaminants, corrosion or other causes. Limit absorption of moisture as specified for Type I units.
- B. Deliver cementitious materials in manufacturers' original, unopened containers.
- C. Store cementitious materials above ground, under cover and in dry enclosure.
- D. Store aggregates so that separation of types of materials can be maintained.



- E. Protect masonry accessories from corrosion and accumulation of dirt.

#### 1.06 PROJECT CONDITIONS:

- A. Protect exposed masonry work against staining and mortar droppings. Keep top of walls covered with non-staining waterproof paper or plastic sheet when work is not in progress and during precipitation of rain or snow. When work is resumed, clean top surface of walls free of loose mortar and in dry weather wet the surface before proceeding.
- B. Turn scaffolding plank every night and when wet to prevent spattering mortar on face of walls.
- C. Do not superimpose any load to masonry work for 12 hours after erection. Allow 3 days before applying concentrated loads.
- D. Cold Weather Protection:
  - 1. Remove ice or snow from masonry bed by applying heat until top surface is dry to touch.
  - 2. Remove all frozen or damaged masonry work.
  - 3. Do not use wet or frozen units or units. Units must be minimum of 20°F (-7°C) when laid.
  - 4. Never allow mortar to freeze
- E. Construction Requirements While Work is Progressing:
  - 1. For all air temperatures below 40°F (4°C), heat sand or mixing water to produce mortar temperatures between 40°F (4°C) and 120°F (49°C).
  - 2. Additionally, for all air temperatures below 25°F (-4°C), provide heat sources on both sides of wall during construction AND provide windbreaks when wind exceeds 15 mph.
  - 3. Additionally, for all air temperatures 20°F (-7°C) and below, provide enclosures and heat to maintain air temperature above 32°F (0°C).
- F. Protection requirements for completed work:
  - 1. Mean daily air temperature: 40°F (4°C) to 32°F (0°C):
    - a. Protect masonry from rain or snow with weather-resistive covering for 24 hours.
  - 2. Mean daily air temperature: 32°F (0°C) to 25°F (-4°C).
    - a. Completely cover masonry with weather-resistive covering for 24 hours.
  - 3. Mean daily air temperature: 25°F (-4°C) to 20°F (-7°C).
    - a. Completely cover masonry with insulating blankets or equal protection for 24 hours.
  - 4. Mean daily air temperature: 20°F (-7°C) and below.
    - a. Maintain masonry temperature above 32°F (-7°C) for 24 hours by using enclosures and supplementary heat or with electric heating blankets.

## PART 2 PRODUCTS

### 2.01 MASONRY MATERIALS:

- A. Concrete block shall be hollow load-bearing concrete masonry units, conforming to latest edition ASTM C 90, made with Shalite, or equal, light-weight aggregate. Units shall be steam cured at atmospheric pressure for not less than 12 hours at temperatures between 160 and 190 degrees F., and then shall be air dried and cured at least 28 days. When delivered to the site, units shall

have a moisture content of not more than specified in latest edition ASTM C 90. Units generally shall be 8"x16" nominal face size and thicknesses shown on the drawings. Exterior walls shall be constructed using split face units and smooth face scored units.

1. Units generally shall be 8" x 16" nominal face size and thicknesses shown on the drawings. Furnish all special sizes, lintel blocks and other special shapes required by job conditions.
    - a. Precast U-Lintels and special shapes made from 3,500 psi concrete with reinforcing bars placed as indicated and filled with coarse grout shall be acceptable upon review and approval by the Structural Engineer of Record. Units shall have a sand block finish to match adjacent CMU.
    - b. Basis of Design: Precast concrete u-lintels are based on products manufactured by Cast Crete. Subject to compliance with requirements.
  2. All exterior corners of interior masonry walls to be exposed to view shall be made with bull-nose (radius edge) block.
  3. **All split face and smooth face block used on the exterior of the building shall be cast with integral color to match existing split face block used on exterior of building. Color will not be white. All block to be used on the exterior of the building shall be cast with integral waterproofing agent similar and equal to Acme Shield or Grace Industries "Dry Block System".**
- B. Where it is necessary to cut masonry, use an approved masonry saw. Use no units less than half size. Promptly remove units showing evidence of being broken and replace with properly cut units.
- C. Where fire rated block are called for on the drawings, units shall be provide which have been tested by a recognized testing laboratory and found to be in conformance with the requirements of the building code in effect for the authority having jurisdiction for fire rated CMU products of the various ratings required.

## 2.02 REINFORCING MATERIALS:

- A. Masonry wall reinforcing for all masonry walls and partitions shall be ladder design configured as required for the wall assembly indicated as manufactured by Heckmann, Hohmann & Barnard, Wire-Bond or approved equal, and shall have product approval of the International Building Code Congress. Reinforcing shall be manufactured from cold drawn steel wire conforming to ASTM A 8272 and shall consist of two deformed longitudinal rods welded at 16" intervals to a continuous diagonal cross rod forming a truss design. Out-to-out spacing of side rods shall be approximately 2" less than the nominal thickness of the wall or partition. Cross rods and side rods shall be not less than No. 9 gage. Reinforcing for exterior walls shall be 170-ML Truss Adjustable Eye-Wire as manufactured by Hohmann & Barnard or approved equal manufactured from cold drawn steel wire conforming to ASTM A 8272.
1. Exterior walls completely embedded in mortar or grout: reinforcement shall be galvanized in accordance with ASTM A641 Class 3 (.8 ounces per square foot).
  2. Exterior walls not completely embedded in mortar or grout: reinforcement shall be galvanized in accordance with ASTM A 153 Class B2 (1.5 ounces per square foot).

## 2.03 MORTAR MATERIALS:

- A. Portland Cement shall conform to ASTM C150, Type 1. Masonry cement shall conform to ASTM C91, and shall be equal to Cemex, Brixment, or Lone-Star Brand. Hydrated lime shall conform to ASTM C207, Type S.
- B. ASTM C 144; except for joints less than 1/4" thick, use aggregate graded with 100 percent passing the No. 16 sieve and shall be uniform in color for all masonry work.
- C. Mixing water shall be clean and free from harmful amounts of acids, alkalies and organic materials.
- D. Mortar shall conform to requirements of ASTM C270. Mortar for masonry work below grade shall be one part Portland Cement, 1/4 part hydrated lime or lime putty, and not less than 2-1/4 nor more than 3 parts sand, by volume, or any other mix conforming to ASTM requirements for Type M or Type S mortar. Mortar for masonry work above grade shall be one part masonry cement to not less than 2-1/4 nor more than 3 parts sand, by volume, or any other mix conforming to ASTM requirements for Type S or Type N mortar.
- E. Sand for mortar shall be measured in a damp loose condition. Mix mortar with the maximum amount of water consistent with satisfactory workability for a minimum of 3 minutes in a drum type mechanical mixer. Mixer shall be thoroughly cleaned between batches. **No re-tempered or partially hardened mortar shall be used.**

#### 2.04 CONTROL JOINTS:

- A. Wide Flange Type: "Wal-Joint" as manufactured by Hohmann & Barnard, Inc., or equal products of Carter-Waters, Tywal Accessories, or Vinyles are acceptable.
- B. Provide vertical control joints in all masonry walls that exceed 32'-0" in length and/or exceed a ratio of panel length to height (L/H) of 3.
- C. All joint locations must be verified and approved by the Architect. Control joints shall not be placed above or at the side of a masonry opening except where necessary to separate masonry supported off the foundation from that supported from the structure.
- D. Steel lintels supporting masonry shall be discontinuous at control joints & expansion joints.

### PART 3 EXECUTION

#### 3.01 COORDINATION WITH OTHER WORK:

- A. Coordinate with other trades to insure that they have ample opportunity to build in their work as the masonry work progresses. Build in frames, anchors, thru-wall flashing, and other incidental items furnished under other sections of the specifications. Set loose steel lintels and construct chases and recesses as required. Verify dimensions and locations of anchors, chases, etc., with the other trades involved.
- B. Coordinate the masonry work for reinforced concrete block walls closely with the installation of the concrete fill and steel reinforcement.
- C. Furr out around piping and electrical panels and other items wherever the existing wall or proposed walls are not thick enough to accommodate items that are scheduled to go in them.
- D. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been completely resolved.

#### 3.02 TOLERANCES FOR CONSTRUCTION:

- A. Bed joints and head joints shall be nominal 3/8" thick with slight variations allowed (5/16" to 7/16") to adjust coursing and to avoid cutting.
- B. Variation from the plumb in the lines and surfaces of columns, walls, and arises shall not exceed 1/8" in 10' and 3/8" in a story height or 3/8" in 20'-0" maximum. Variation from plumb for external corners, expansion joints and other conspicuous lines, shall not exceed 1/4" in any story or 1/4" in 20'-0" maximum.
- C. Variation from the level of the grades indicated on the Drawings for exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines shall not exceed 1/4" in any bay or module or 20'-0" (whichever dimension is the least) nor 1/2" in 40'-0" or more.
- D. Variation of the linear building line from an established position in plan and related portion of columns, walls, and partitions shall not exceed 1/4" in any bay or module or 20'-0" (whichever dimension is the least) nor 3/4" in 40'-0" or more.
- E. Variation in cross-sectional dimensions of columns and thickness of walls shall not exceed minus 1/4", nor plus 1/2" from the dimensions indicated on the Drawings.

### 3.03 LAYING CONCRETE BLOCK:

- A. Lay with full mortar coverage on vertical and horizontal face shells. Vertical joints in exposed concrete block work shall break at center of stretcher above and below; otherwise, bond each course at corners and intersections and break vertical joints at least 4".
- B. Broken or split block shall not be used. All cutting required shall be done with a masonry saw. The mortar bedding for anchors for door bucks and frames shall be spread on strips of 1/8" mesh hardware cloth about 12" long.
- C. Install steel masonry reinforcing in all concrete block walls and partitions. Partitions abutting exterior walls shall be anchored thereto with steel masonry reinforcing unless otherwise noted.
- D. Partitions enclosing pipe and duct chases shall be built after the piping and ducts are in place and have been tested and approved.
- E. All partitions shall extend from concrete floor slabs to underside of roof deck except where specifically noted or shown otherwise. All partitions shall be not less than 1-hour fire-resistive construction and the concrete blocks shall be UL listed or shall conform to requirements of the Building Code adopted by the authority having jurisdiction for 1-hour fire-resistance.
- F. Install precast masonry lintels over all openings greater than 24" wide in concrete walls and partitions, including openings for panelboards, ducts, and grills.
- G. Install spandrel blocks for bond beams at the top of all masonry walls unless noted otherwise.
- H. Where wythe thickness changes or where masonry other than CMU bears on CMU, fill CMU cells with grout to provide solid bearing unless otherwise noted.
- I. Where masonry is to be exposed in the interior of a building the mortar joint at the intersection of interior masonry wall with exterior masonry wall shall be raked 1/4 inch deep and caulked.

### 3.04 WORKMANSHIP:

- A. Masonry work shall be sound, straight, true, and complete in every respect, and exterior walls shall be so constructed as to preclude the penetration of water. Avoid over-plumbing and pounding of masonry units after they are set in place; where adjustments must be made after mortar has started to set, the mortar shall be removed and replaced with fresh mortar.

- B. Joints shall be thickness to conform to coursing specified or shown and shall be uniform and bond shall be true.
- C. Hollow metal door frames in masonry walls shall be filled solidly with mortar as the walls are laid up, but forming a cavity behind rubber bumper opening with a wad of newspaper. Unless otherwise specifically shown or specified, the space around anchors, flashing, steel lintels, and similar items built into the masonry work shall be filled solidly with mortar.
- D. Where nails or line pins have been used, they shall be removed when they have served their purpose and the holes left by their removal shall be filled immediately with fresh mortar.

3.05 POINTING:

- A. After masonry work is completed, remove all line pins and point up all holes and open joints.

3.06 TOOLING:

- A. Tool all joints concave unless otherwise noted. Tool joints with a round steel jointer with sufficient force to press the mortar against masonry units on each side of the joint.
- B. Cut joints flush in masonry surfaces which are concealed or to which a finish material (other than paint) shall be applied.
- C. Joints where masonry changes color shall be raked joints.

3.07 CLEANING OF MASONRY:

- A. Exposed concrete block surfaces shall be kept clean of mortar droppings as the work progresses and the completed work shall be dry-cleaned to remove remaining mortar spots and dirt. Surface shall be brushed free of dust before painting.

End of Section

## SECTION 04 40 00 – SYNTHETIC STONE VENEER

### 1PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials and equipment, and perform all work required to install synthetic stone veneer work as shown on the drawings, including synthetic stone, metal lath, bonding and grouting mortars, and all necessary incidental work in connection therewith.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 QUALITY ASSURANCE:

- A Qualifications of workmen:
1. For the actual cutting and placing of synthetic stone units, use only skilled journeyman masons who are thoroughly experienced with the materials and methods specified and thoroughly familiar with the design requirements.
  2. In acceptance or rejection of installed concrete masonry units, no allowance will be made for lack of skill on the part of workman.
  3. Provide at least one (1) skilled journeyman mason who shall be present at all times during execution of the work of this Section and who shall personally direct the execution of this portion of the work.
- B Masonry units exposed to view shall be obtained from a single manufacturer; each type of product shall be from a single batch or production run.
- C Cementitious ingredients of mortar mix shall be obtained from a single manufacturer. Each aggregate for mortar mix shall be obtained from a single source.
- D Comply with applicable portions of the American Society for Testing and Materials (ASTM) Applicable codes and regulations of authorities having jurisdiction.

#### 1.04 SUBMITTALS:

- A Submit a 4' x 4' grouted sample of Mountain Stone so that accepted stone veneer to be used falls within accepted range of sizes, color, texture, and grouted joint style. Sample shall remain on job until project is completed.

#### 1.05 DELIVERY, STORAGE, AND HANDLING:

- A Deliver masonry materials in undamaged condition. Handle masonry units to prevent damage. Store in a manner to protect against excessive moisture, temperature changes, contaminants, corrosion or other causes.
- B Deliver cementitious materials in manufacturers' original, unopened containers.
- C Store cementitious materials above ground, under cover and in dry enclosure.
- D Store aggregates so that separation of types of materials can be maintained.
- E Protect masonry accessories from corrosion and accumulation of dirt.

1.06 PROJECT CONDITIONS:

- A No masonry shall be laid in freezing weather or when air temperature is below 40° F or forecasted to go below 40° F within 24 hours. Protect exposed concrete block work against staining and mortar droppings. Keep top of walls covered with non-staining waterproof paper or plastic sheet when work is not in progress and during precipitation of rain or snow. When work is resumed, clean top surface of walls free of loose mortar and in dry weather wet the surface before proceeding.
- B Turn scaffolding plank every night and when wet to prevent spattering mortar on face of walls.

1.07 PRODUCT PACKAGING AND HANDLING:

- A Mountain Stone is packaged on 40 x 48 pallets with 24 boxes per pallet. Each box contains 10 square feet of the stone. Corners are 10 linear feet per box. Pallets can be stacked 3 high for easy space saving, storage and inventory control. Boxes weigh approximately 65 lbs. each.

2PART II PRODUCTS

2.01 PRODUCT NAME:

- A Manufactured synthetic stone veneer for exterior and interior wall covering as shown on drawings.

2.02 MANUFACTURER:

- A. Pre-approved Manufacturer: Mountain Stone Products, 4301 Industrial Road, Bowling Green, KY 42101, Phone: (270) 796-6123
- B. Alternate manufacturers must be approved by Architect prior to bidding.

2.03 MATERIAL COMPOSITION:

- A Stone veneer to be produced of Type 1 Portland cement, expanded aggregate, and additives to meet or exceed the following specifications:

Water Absorption:	3.3%
Compressive Strength:	3,260 psi+
Thermal Conductivity:	1.38 R-Factor

2.04 ACCESSORY MATERIALS:

- A. Provide preformed corners for use on all corners and offsets.
- B. Provide special shapes such as window sills, keystones and arches as shown on the drawings.

2.05 INSTALLATION MATERIALS:

- A All equipment and materials are to be clean and free from chemicals that may cause efflorescence. Materials shall conform to:

Type 1 Portland cement:	ASTM C150
Sand:	ASTM-C-144
Use clean potable water	
Reinforcement wire-mesh:	Galv. 2.5#
Joint color-pure iron oxide colors or	
Mortar Type:	N

2.06 METAL LATH:

- A To Masonry: Stone may be applied directly to masonry wall provided the wall's surfaces should be sand blasted or covered with metal lath using 1" masonry nails.
- B Wood/Metal Studs or Metal Buildings: 2.5# Galvanized metal lath is backed with 15 lb. paper, then secured to the studs or metal high rib with No. 8 self-tapping metal screws no less than ¼" penetration into metal.

2.07 BONDING MORTARS:

- A Use Type S mortar with clean brick sand. Mixture will be 1-1/2 parts sand and 1 part Type S mortar. This mixture shall be used on covering metal lath and adhering stone only. Mixture to be mixed thoroughly and evenly.

2.08 GROUTING MORTARS:

- A Shall be 1 part Type N mortar to 1-1/2 to 1-3/4 part clean brick sand. Mixture is to be thin enough to be squeezed easily from a grout bag with a hole about the size of a penny. Grout shall set after grouting so that when tooled it will not smear and stain stone.
- B Colored Joints: Colors shall be selected from standard colors available from approved manufactures of iron oxide.

3PART III EXECUTION

3.01 SURFACE CONDITIONS:

- A Examine the areas and conditions under which work will be performed. If problems are found, do not proceed until unsatisfactory conditions are corrected.
- B Coordinate with other trades as needed to assure that proper substrate is provided to receive the stone veneer.
- C Condition of surfaces to receive stone veneer:
  - 1. Verify that surface to receive mortar setting bed and stone are firm, dry clean, and free from substances that may not let product bond properly.
  - 2. Verify that all electrical, plumbing, etc. in or behind the stone have been installed before proceeding with installation of the stone work.

3.02 INSTALLATION OF STONE VENEER:

- A Maintain minimum temperature limits on job site and installation practices recommended by materials manufacturer.
  - 1. Prepare the surfaces, set, fit, group, and clean the work of this section in strict accordance with the manufacturer's recommendations.
  - 2. Spread mortar on stone's back a minimum of ½" thick.
  - 3. Press and set the stone until stones are firmly set.

3.03 CLEANING:

- A Do not begin grouting stone until stones are firmly set.
- B Force the maximum amount of grout into joints using a grout bag filling all gaps and skips.
  - 1. Do not permit grout on stone face.



2. Remove surplus grout from joints by raking and tolling. Sweep all areas to remove excessive material.
3. Remove mortar and haze from the face of the stone within two (2) hours of placing.

3.04 CLEANING:

- A After completion of setting and grouting, thoroughly clean stone face by sweeping. Do not use acid or any cleaners.

End of Section

## SECTION 04 42 00 – CULTURED MARBLE SILLS

### 1 PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish and install cultured marble window sills as shown on the drawings.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 QUALITY ASSURANCE:

- A. Applicable performance standards: Standards of the following, as referenced herein:
  - 1. American National Standards Institute (ANSI) - Z-124.1,2,3,4 / ANSI A-112.19.7 & 8
  - 2. Applicable building codes
- B. Provide provision of evidence of certification to applicable standards.
- C. Allowable tolerances:
  - 1. Variation in component size: +/- 1/4" (6mm)
  - 2. Location of openings: +/-1/4" (6mm) from indicated position
- D. Installer qualification: Engage a duly qualified and experienced installer who has demonstrated successful installation of cast polymer products similar in material design, and to extent indicated for the project. The installer shall be approved by the manufacturer insofar as product warranty is maintained

#### 1.04 SHOP DRAWINGS:

- A. Shop drawings: Indicate dimensions, component sizes, installation details, attachment provisions and coordination requirements with adjacent work.
- B. Samples: Submit minimum 6" x 6" (156mm x 156mm) samples. Indicate full range of color and pattern variation. Samples shall be used to verify standard of work.
- C. Product data: Indicate product description, installation information and compliance with specified performance requirements.
- D. Maintenance data: Submit manufacturers care and maintenance recommendations, including recommended repair and cleaning instructions.

#### 1.05. DELIVERY, STORAGE AND HANDLING:

- A. Deliver no components to project site until ready for installation. Store indoors.
- B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

#### 1.06 WARRANTY:

- A. Provide manufacturer's warranty.

## 2 PART III EXECUTION

### 2.01 MATERIALS:

- A. Material shall be synthetic marble: A precise blend of polyester resin, highly filled with catalysts and engineered calcium carbonates and pigments thoroughly mixed and placed into open molds which are coated with a clear gelcoat. The gelcoat is especially formulated so to as produce a tough, durable, non-porous and shiny surface, very mar resistant and easy to maintain.
- B. Marble shall be synthetic material, 3/4" thick.
- C. Marble at windows shall run the width of the window and provide a 1" overhang over the finish surface below the window.
- D. Fabricate sills in as long sections as practicable for handling and installation. When forming continuous sills use no piece shorter than 2'-0".
- E. Color and texture shall be selected by architect from manufacturer's standard options.

### 2.02 PERFORMANCE REQUIREMENTS:

Property	Requirement	Method
Color fastness	No change - 200 hours	ANSI Z-124
Wear and Cleaning	Passes	ANSI Z-124
Impact resistance	No cracks or chips	ANSI Z-124
Stain resistance	Passes	ANSI Z-124
Chemical resistance	Passes	ANSI Z-124
Drain Fitting Connection	Passes	ANSI Z-124.3
Loads on lavatory tops	Passes	ANSI Z-124.3
Thermal shock resistance	Passes	ANSI Z-124.3
Cigarette burn test	Passes	ANSI Z-124.3

## PART III EXECUTION

### 3.01 INSTALLATION OF WINDOW SILLS:

- A. Install components plumb and level, scribe to adjacent finishes, in accordance with approved shop drawings and recommended installation instructions.
- B. Form field joints using manufacturer's recommended adhesive.
- C. Protect surfaces from damage during installation. Repair or replace damaged product that does not meet Architect's satisfaction.
- D. Protect product during subsequent construction activity.

End of Section

## SECTION 05 50 00 – SHOP FABRICATED METAL

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, tools, equipment, coordination, supervision services, etc., as required for complete performance of the work as shown on the drawings and specified herein.
- B In General this Section Includes the Following: Fabricate and deliver rough hardware, steel stair framing and stair handrails, and other miscellaneous shop fabricated steel items not supplied with other supplied steel fabrications.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBMITTALS:

- A Shop drawings detailing fabrication and erection of each metal fabrication. Include plans, elevations, sections and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections. Welder's certificates signed by Contractor certifying that welders comply with requirements specified herein.

#### 1.04 QUALITY ASSURANCE:

- A Fabrication firm shall have experience at successfully producing metal fabrications similar to those indicated, and have sufficient production capacity to produce required work without causing delay.
- B Installation of each item shall be performed by same firm that fabricated them.
- C Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel", D1.3 "Structural Welding Code – Sheet Steel".
- D Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved, and if pertinent, has undergone re-certification.

### PART II PRODUCTS

#### 2.01 MATERIALS:

- A Cast Iron: Clean, tough gray iron free from blow holes, cinder spots or cold shuts. Conforming to ASTM Specifications.
- B Wrought Iron: (1) Plates, ASTM A52; Sheet, ASTM A162; and Bolts, Rods, Bars, ASTM A141.
- C Structural Steel: ASTM A36.
- D Aluminum: Type recommended by manufacturer unless specifically noted.

#### 2.02 SHOP PAINT:

- A All ferrous metal items shall be painted one coat of rust inhibitive shop primer except those with galvanized finish or to be embedded in concrete or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA1 "Paint Application specification No. 1" for shop painting.

2.03 BOLTS AND ANCHORS:

- A Furnish and install all bolts, anchors, expansion bolts, etc., as needed to properly install all items of work, including woodwork, etc.
- B Joints: Tightly fitted, finished smooth and even concealed where possible, rivets countersunk on exposed surfaces. No drifting.
  - 1. Steel: Riveted or welded.
  - 2. Castings: Concealed bolts or cap screws counter-sunk on face.
  - 3. Wrought Iron: Welded or machine screws.
  - 4. Exterior Work: Shed water and prevent entrance to hollow work.
  - 5. Aluminum: Welded, ground and buffed for flush machine screws.

2.04 EQUIPMENT SUPPORTS:

- A Provide equipment supports of structural shapes where shown and as detailed and where not furnished by equipment contractors.

2.05 METAL HANDRAILS:

- A Materials: Standard steel pipe and steel bar of size indicated, cast or malleable iron flanges. Provide handrails both sides of all stairs and mechanical walkway, and at one side of the walking track.
- B Joints: Welded, ground smooth.
- C Setting: Weld to structure and provide welded flanges at walls. Expansion bolt all flanges with countersunk flat head bolts.

2.06 STEEL LINTEL ANGLES FOR OPENINGS IN MASONRY:

- A Unless otherwise shown, loose lintels shall be 16 inches larger than the masonry to masonry opening over which they occur. Unless otherwise shown, they shall be 6 inch by 3-1/2 inch by 3/8 inch angles, one for each 4 inches of wall thickness. Furnish other miscellaneous structural shapes to be built by masons or other trades which are not elsewhere specified.

2.07 STEEL STAIRS:

- A Stringers, supports and connections for steel stairs shall be designed to sustain a live load of not less than 100 pounds per square foot. Treads shall be designed to carry a minimum concentrated load of 300 pounds on the centerline of tread span.
- B Stringers shall be 12" x 1-1/2" x 10.6# channels minimum. Exposed open ends of stringers shall be closed by filler plates welded in place.
- C Interior stair treads, unless noted otherwise, shall be designed to receive precast concrete treads.
  - 1. Interior risers shall be closed with #16 gauge sheet steel riser plates secured to treads by bolting.
- D Stair railings, unless otherwise noted, shall be fabricated of 1-1/4" Schedule 40 black steel pipe. Railings shall be supported from stringers except where walls are adjacent to railings.
  - 1. Provide Julius Blum #382 supports at 4'-0" O.C. maximum unless otherwise noted at wall railings. Steel shall conform to ASTM Designation M1020. Pickets at railings supported from stringers shall be spaced as required to prevent the passage of a 4 inch diameter sphere.

- E Provide any necessary light I-beam, channel, angle or tee framing, hangers, etc., at various floor and platform levels to properly receive the stair construction.
- F Wall stringers shall continue around platforms, forming a base 4" high.
- G Bracket angles for treads and risers shall be at least 1-1/4" x 1-1/4" x 3/16" angles, welded to stringers.
- H Platforms shall be of not less than #12 gauge sheet steel. Support platforms on rolled tees spaced not over 30" on center. Tees shall be WT 2.5 x 8 for spans up to 5'-0". Longer spans shall be designed for a live load of 100 lbs. per sq. ft. Platforms shall be welded to tees.
- I All joints shall be ground smooth.

2.08 HINGES FOR DUMPSTER PAD GATES:

- A Hinges: heavy duty barrel hinges similar to BRHC7-212 as manufactured by Tennessee Fabricating Company, 2025 York Avenue, Memphis TN 38104, 901-725-1548, Fax: 901-725-5954 and meet or exceed the specified requirements. Hinges shall have 7" x 1-1/2" Barrel Diameter, 3/4" stainless steel pin, load capacity per pair: 2,200 lbs.

2.09 GROUT AND ANCHORING CEMENT:

- A Non-Shrink, Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CECRD-C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.
- B Interior Anchoring Cement: Factory-prepackaged, non-shrink, non-staining, hydraulic controlled expansion cement formulation for mixing with water in field to create pourable anchoring, patching, and grouting compound. Use for interior applications only.
- C Erosion Resistant Anchoring Cement: Factory-prepackaged, non-shrink, non-staining, hydraulic controlled expansion cement formulation for mixing with water in field to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without need for protection by sealer or waterproof coating and is recommended for exterior use by manufacturer.
- D Subject to compliance with requirements, acceptable products include, but are not limited to, the following:

1. Non-Shrink, Non-Metallic Grouts:

"Bonsal Construction Grout": W.R. Bonsal Co.  
"Diamond-Crete Grout": Concrete Service Materials  
"Euco N-S Grout": Euclid Chemical Co.  
"Kemset": Chem-Masters Corp.  
"Crystex": L & M Construction Chemicals, Inc.  
"Masterflow 713": Master Builders  
"Sealtight 588 Grout": W.R. Meadows, Inc.  
"SonogROUT": Sonneborn Building Products Div. Rexnord Chemical Products Inc.  
"Five Star Grout": U.S. Grout Corp.  
"Vibropruf #11": Lambert Corp.

2. Interior Anchoring Cement:

"Bonsal Anchor Cement": W.R. Bonsal Co.  
"Pro-Rok": Minwax Construction Products Div.

3. Erosion -Resistant Anchoring Cement:  
"super Por-Rok": Minwax Construction Products Div.

## 2.10 FASTENERS:

- A Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for their intended use, type, grade, and class required.
1. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
  2. Lag Bolts: Square head type, FS FF-B-561.
  3. Machine Screws: Cadmium plated steel, FS FF-S-92.
  4. Wood Screws: Flat head carbon steel, FS FF-S-111.
  5. Plain Washers: Round, carbon steel, FS FF-W-92.
- B Drilled-In Expansion Anchors: Complying with FS FF-S-325, Group VIII (anchors, expansions, {non-drilling}), Type I (internally threaded tubular expansion anchor), and machine bolts complying with FS FF-B575, Grade 5.
1. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.
  2. Lock Washers: Helical spring type, carbon steel, FS FF-W-84.
  3. Ferrous Metal Shop Primer: Manufacturer's or Fabricator's standard, fast-curing, lead-free, universal modified alkyd primer; selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements of FS TT-P-645
  4. Galvanized Repair Paint: High zinc dust content paint for reglazing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint-20.
  5. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint-12 except containing no asbestos fibers.

## 2.11 FABRICATION:

- A Fabricate items from materials of size, thickness, and shapes indicated by not less than that required to comply with performance indicated. Work to dimensions indicated or accepted on shop drawings, using proven details for fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
- B Fabricate exposed work true to line and level, with accurate angles and surfaces, and straight sharp edges.
- C Allow for thermal movement through a maximum ambient temperature change (range) of 100° F (55.5° C) in the design, fabrication, and installation of assemblies, without buckling, opening up of joints, and overstressing of welds of welds and fasteners. Base design calculations of actual surface temperatures of metals due to both solar heat gain and night time heat loss.
- D Shear and punch metals cleanly and accurately. Remove burrs.
- E Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- F Remove sharp or rough areas on exposed traffic surfaces.
- G Weld corners and seams continuously, complying with AWS recommendations and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove welding flux immediately.
  4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.
- H Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- I Provide anchorages of types indicated, coordinated with supporting substrates. Fabricate and space anchoring devices to provide adequate support for intended use.
- J Assemble items in shop to greatest extent possible. Partially fabricate only as necessary for shipping and handling limitations. Employ connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- K Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
- L Fabricate joints that will be exposed to weather in a manner to exclude water or provide weeps where water may collect.
- 2.12 ROUGH HARDWARE:
- A Furnish/fabricate bent or otherwise custom fashioned bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing/supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Furnish straight bolts and other stock rough hardware items as specified in DIVISION 6 Sections.
- B Fabricate items to sizes shapes and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, provide steel washers.
- 2.13 BEARING AND LEVELING PLATES:
- A For steel items bearing on masonry or concrete, provide loose bearing and leveling plates, free from warps or twists, and of required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.
- 2.14 FINISHES, GENERAL:
- A Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.
- B Finish metal fabrications after assembly.
- 2.15 STEEL AND IRON FINISHES:
- A Galvanizing: For items indicated to be galvanized, apply zinc-coating by the hot-dip process in compliance with the following requirements:
1. ASTM A 153 for galvanizing iron and steel hardware.
  2. ASTM A 123 for galvanizing both fabricated and unfabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299 inch thick and heavier.



- B Prepare uncoated ferrous metal surfaces for shop priming in compliance with the following requirements for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
1. Exteriors (SSPC Zone 1B): SSPC-SP6 "Commercial Blast Cleaning".
  2. Interiors (SSPC Zone 1A): SSPC-SP3 "Power Tool Cleaning".
- C Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finish or to be embedded in concrete or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA1 "Paint Application Specification No. 1" for shop painting.

### PART III EXECUTION

#### 3.01 INSTALLATION:

- A Install anchorage devices and fasteners necessary for securing miscellaneous metal fabrications to substrates; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
- B Perform cutting, drilling and fitting for installation of miscellaneous metal fabrications. From established lines and levels, locate and align fabrication accurately, at proper elevation, with edges and surfaces level, plumb, true and free of rack.
- C Temporarily brace anchors which are to be built into concrete, masonry or similar construction.
- D Fit exposed connections accurately together to form hairline joints. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior galvanized items, and those intended for bolted or screwed field connections.
- E For field welds, comply with AWS Code for procedures of manual shielded metal-arc welding, in appearance and quality of welds made, and methods used in correcting welding work.
- F Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
- G Obtain fusion without undercut or overlap. Remove welding flux immediately.
- H At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour matches adjacent surface.

#### 3.02 SETTING LOOSE PLATES:

- A Clean concrete and masonry bearing surfaces of foreign matter and roughen to improve bonding. Clean bonding surface of bearing plates.
- B Set plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. do not remove shims; if protruding, cut-off flush with edge of bearing plate before packing with grout. Pack grout leaving no voids between bearing surface and plate.
- C Use metallic non-shrink grout in concealed locations where not exposed to moisture; use non-metallic, non-shrink grout in exposed locations, unless otherwise indicated.

#### 3.03 ADJUSTING AND CLEANING:

- A Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint and paint exposed areas with same materials as used for shop painting. Comply with SSPC-PA1

requirements for touch-up of field painted surfaces. Apply by brush or spray to provide a minimum dry thickness of 2.0 mils.

- B Clean field welds, bolted connections and abraded areas of galvanized items and apply galvanizing repair paint in compliance with ASTM A 780.

End of Section

## SECTION 06 10 00 - ROUGH CARPENTRY

### 1 PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials, equipment and supervision necessary to perform all work traditionally performed by Carpenter including furnishing and installing rough carpentry as herein specified and shown on the drawings as necessary to complete the work.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section	06 19 20	Pre-Fabricated Wood Trusses
Section	09 90 00	Painting

#### 1.03 SUBMITTALS:

- A. Submit shop drawings on fabricated items.
- B. Pressure treated wood: Submit certification by treating plant stating chemicals and process used, net amount of salts retained, and conformance to applicable standards.
- C. Preservation treated wood: Submit certification for waterborne preservative that moisture content was reduced to moisture content specified elsewhere in this section.

#### 1.04 REFERENCES:

- A. Applicable Standards:
  - 1. American Plywood Association (APA), current standards.
  - 2. American Society for Testing and Materials (ASTM), standards as referenced herein.
  - 3. American Wood Preservers Association (AWPA), standards as referenced herein.
  - 4. Product Standards (PS) of the National Bureau of Standards, U.S. Department of Commerce, standards as follows:
    - a. Softwood lumber: PS 20-99.
    - b. Softwood plywood: PS 1-83.
- B. Grading rules; current rules of the following associations applicable to wood materials:
  - 1. Southern Pine Inspection Bureau (SPIB).
  - 2. Western Wood Products Association (WWPA).
  - 3. West Coast Lumber Inspection Bureau (WCLIB).
  - 4. National Lumber Grades Authority (NLGA).

#### 1.05 QUALITY ASSURANCE:

- A. Product identification:
  - 1. Lumber: Lumber shall bear the grade stamp of a listed grading rules association certified by the Board of Review of the American Lumber Standards Committee (ALSC), identifying species or species combination, grade, moisture content at time of surfacing, mill origin and grading agency.

2. Plywood: Plywood shall bear the stamp of the American Plywood Association (APA), indicating type, grade, thickness, exposure durability, span rating, species group, edging, surface finish, and regulatory agency compliance.
3. Pressure-preservative-treated wood materials: Pressure-preservative-treated lumber and plywood shall bear the quality standard stamp of the applicator indicating compliance with AWWA standards, preservative type used, retention level, exposure conditions, treating company and plant location, year of treatment and name of certified treatment inspection agency.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials to project site and place in areas protected from the weather.
- B. Store materials minimum 6" off of ground or floor on level blocking. Cover with waterproof sheets or tarps if stored outdoors. Provide for adequate air circulation and ventilation when covering materials.
- C. Do not store seasoned materials in wet or damp areas of building.
- D. Protect edges, ends, corners and surfaces of sheet materials from damage.

2 PART II PRODUCTS

2.01 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.
- B. Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
- C. Framing: Provide the following grades and species:
  1. Grade: No. 1.
  2. Species: Any species with a modulus of elasticity and an extreme fiber stress in bending as indicated on Drawings
- D. Refer to Structural Drawings for requirements for structural Framing Grades.

2.02 BOARDS

- A. Concealed Boards: Where boards will be concealed by other work, provide lumber with 15 percent maximum moisture content and of following species and grade:
  1. Species and Grade: Eastern softwoods, No. 3 Common per NELMA rules.
  2. Species and Grade: Northern species, No. 3 Common or Standard per NLGA rules.
  3. Species and Grade: Mixed southern pine, No. 2 per SPIB rules.
  4. Species and Grade: Hem-fir, Standard per WCLIB rules or No. 3 Common per WWPA rules.
  5. Species and Grade: Spruce-pine-fir, Standard per WCLIB rules or No. 3 Common per WWPA rules.
  6. Species and Grade: Western woods, Standard per WCLIB rules or No. 3 Common per WWPA rules.

2.03 MISCELLANEOUS LUMBER

- A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds,

stripping, and similar members.

- B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.
- C. Moisture Content: 15 percent maximum for lumber items not specified to receive wood preservative treatment.
- D. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

#### 2.04 SHEET MATERIALS:

- A. Plywood:
  - 1. Interior wall surfaces: APA A-D, GROUP 1, INTERIOR, thickness as indicated; A-grade veneer face to exposed side.
  - 2. Exterior wall sheathing: APA-rated sheathing.
    - a. Exposure Durability Classification: Group 1.
    - b. Span Rating: As required to suit stud spacing indicated.
  - 3. Exterior roof sheathing: APA-rated sheathing.
    - a. Exposure Durability Classification: Group 1.
    - b. Span Rating: As required to suit truss spacing indicated.
- B. Treated Plywood:
  - 1. Preservative-treated plywood: APA RATED SHEATHING, EXPOSURE 1, SERIES V-611, thickness as indicated; pressure-preservative-treated as specified herein.

#### 2.05 TREATED WOOD MATERIAL:

- A. Preservative Treatment by Pressure Process: AWPAC2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPAC31 with inorganic boron (SBX).
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium: Alkaline Copper Quat (ACQ), or Copper Azole (CA type A or B)
  - 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
  - 3. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
  - 4. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
    - a. For exposed lumber indicated to receive a stained or natural finish, omit marking and provide certificates of treatment compliance issued by inspection agency.
    - b. Application: Treat items indicated on Drawings AND the following:

- i. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  - ii. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
  - iii. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
  - iv. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
  - v. Wood floor plates that are installed over concrete slabs-on-grade.
5. Where Preservative treated wood is used in contact with metal other than G-90 hot dipped galvanized steel, a separation sheet of either 15-pound unperforated organic asphalt saturated roofing felt complying with ASTM D -226, or 10 mil polyethylene shall be placed between wood and metal to prevent corrosion from contact.

#### 2.06 FIRE RETARDANT TREATED LUMBER:

- A. Comply with AWP C-27 as applicable. Process shall not promote premature degradation of wood products in the conditions in which fire-treated lumber/panels will be installed.
  - 1. Provide materials with maximum moisture content, after treatment, of 15 % or less.
  - 2. Manufacturer: Provide "Dricon FRT" or "D-Blaze FRT" by Chemical Specialties Inc., with current warranty.

#### 2.07 TRUSSED RAFTERS:

- A. The roof framing shall be furnished as a complete system of prefabricated trusses and trussed rafters.
- B. All lumber used in the fabrication of trusses shall be stress graded and shall be of the species, size and grade specified in the truss design. Note that sizes called for on drawings are minimums. Connector plates shall be stamped from 16, 18, or 20 gauge, Grade A, galvanized structural steel. Both plate width and plate length must equal or exceed that specified in the truss design.
- C. Engineering design for trussed rafters shall be provided by the fabricator and shop drawings of the complete framing system shall be furnished to the Architect for approval before trusses are fabricated. Shop drawings shall bear a registered engineer's certification and shall be submitted to the Architect for approval and shall contain the following information for each type and size of truss assembly to be provided: detail of truss, specie, size, and grade of lumber used, and connector plate sizes and orientation. Trusses shall be designed for the roof loads indicated on the Architect's drawings and shall conform to the requirements of the following standards:
  - 1. National Design Specifications for Stress-Grade Lumber and its Fastenings - By National Lumber Manufacturer's Association.
  - 2. Timber Construction Standards - By American Institute of Timber Construction.
  - 3. Design Specifications for Light Metal Plate Connected Wood Trusses - By Truss Plate Institute.
  - 4. International Building Code, Latest Edition.
- D. Trusses shall be shipped and stored at the building site so as to prevent possible warping or twisting which could result in loosening of the gusset plates. Trusses shall be stored flat and level or standing vertical, properly blocked to prevent twisting and covered to protect from damage.

#### 2.08 HARDWARE AND ACCESSORIES:

- A. Fasteners and accessories: Provide nails, bolts, nuts, washers, screws, expansion bolts, lag bolts, clips, powder-actuated fasteners, anchor bolts and similar hardware necessary for complete installation of rough carpentry materials.
- B. Fasteners and anchors for preservative-treated and fire-retardant-treated wood materials: Hot-dipped galvanized or type 304 or 316 stainless steel nails, fasteners, and anchors.
- C. Fasteners for attachment of plywood to light gage steel framing: Corrosion-resistant, type S-12 bugle head self-drilling screws; length as required to extend minimum 1/2" through framing member.
- D. Construction adhesive: meeting APA Performance Specification AFG-01.

### 3 PART III EXECUTION

#### 3.01 WORKMANSHIP:

- A. Install rough carpentry work cut square and straight to provide neat, fitted joints. Set to required levels and lines with members plumb, true, and aligned.
- B. Coordinate and lay out work to provide correct locations and opening to receive work of other trades.
- C. Install framing members aligned, leveled, plumbed and squared over bearing points.
- D. Secure carpentry work in place to substrates and supporting members using fasteners of types and sizes complying with building code requirements and as specified. Install fasteners without splitting wood and with positive anchorage into substrates or adjoining wood members.
- E. Anchor members rigid and secure to adequately resist design loads, maintaining proper alignment, free of warp or wind.
- F. Install linear runs of materials using longest lengths as practicable. Where multiple members are used to form linear runs, offset joints in member not less than three feet.
- G. Bolting: Drill holes 1/16" larger in diameter than bolt to be installed. Drill straight and true from one side only. Provide plates or washers between bolt head or nut and wood surface.
- H. Screws: Pre-bore holes same diameter as root of thread. Enlarge holes to shank diameter for length of shank.
- I. Make wood-to-wood fastenings with proper size cement coated nails.

#### 3.02 TREATED WOOD MATERIALS:

- A. Pressure-preservative-treated wood:
  - 1. Coat cut edges and ends of treated wood, including drilled holes with a brushed-applied preservative solution of copper naphthenate containing minimum 2% metallic copper.
  - 2. Handle and install treated wood in accordance AWWA M4-84.
- B. Attach treated wood materials using hot-dipped galvanized or stainless steel fasteners, nails or anchors as specified.

#### 3.03 PLATES, BLOCKING, NAILERS AND MISCELLANEOUS FRAMING:

- A. Install minimum 2" nominal thickness wood members to support and to provide as a substrate for attachment of finishing materials, trim, fixtures, accessories and specialty items.

- B. Anchor members to structural steel or metal framing using appropriate bolts spaced at 4'-0" o.c. maximum.
- C. Anchor members to concrete or masonry construction using cast-in anchor bolts, powder-actuated studs, or sleeve, wedge or expansion type anchors, spaced at 4'-0" o.c. maximum.
- D. Provide linear members in maximum lengths practicable to minimize joints. Install multiple linear members so that joints are offset minimum 3'-0".
- E. Install anchors and fasteners positioned to be located within 3" of ends of members.
- F. Install furring at 1'-0" o.c. attached to substrates with appropriate fasteners spaced at maximum, 2'-0" o.c.

#### 3.04 STUD FRAMING:

- A. Blocking:
  1. Walls exceeding eight feet in height shall be laterally braced with nominal 2" solid blocking, same width as studs, installed continuous in horizontal row at mid-point of wall height.
  2. Install solid blocking at locations required for attachment of finish materials, wood trim, fixtures, accessories, and specialty items.
  3. Cut blocking to fit snug between studs, wedge, align and anchor to framing by end nailing or toenailing.
- B. Firestopping for wood framing: Install minimum 2" thickness solid wood blocking or framing members to firestop all vertical and horizontal concealed draft opening to comply with governing building code requirements. Firestopping members shall be of sizes matching full width or depth of framing or structural members.

#### 3.05 SHEET MATERIALS:

- A. Install plywood complying with APA Design/Construction Guide-Residential and Commercial unless more stringent requirements are specified.

#### 3.06 INSTALLATION OF ENGINEERED WOOD TRUSSES:

- A. Do not install wood trusses until supporting construction is in place and is braced and secured.
- B. Handling:
  1. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
  2. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
  3. Space, adjust, and align trusses in location before permanently fastening.
- C. Fastening:
  1. Anchor trusses securely at all bearing points using metal framing anchors. Install fasteners through each fastener hole in metal framing anchor according to manufacturer's fastening schedules and written instructions.
  2. Securely connect each truss ply required for forming built-up girder trusses.
  3. Anchor trusses to girder trusses as shown on approved shop drawings.



- 4. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
- D. Install wood trusses within installation tolerances of ANSI/TPI 1.
- E. Do not cut or remove truss members without written approval of truss manufacturer.
- F. Return wood trusses that are damaged or do not meet requirements to fabricator and replace with trusses that do meet requirements.
- G. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

3.07 CLEAN UP:

- A. Clean up debris and excess materials from this work and remove from site. Leave area broom clean.

End of Section

## SECTION 06 19 20 – PREFABRICATED WOOD TRUSSES

### 1 PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials, equipment and supervision necessary to perform all work to complete pre-fabricated wood trusses.

#### B. RELATED DOCUMENTS:

- C. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 06 10 00 Rough Carpentry

#### 1.02 COORDINATION:

- A. Coordinate the location and sequence of this work with other Trades for proper execution to fulfill design requirements. Time delivery and erection of trusses to avoid extended on-site storage.

#### 1.03 DEFINITIONS:

- A. TRUSS: The terms “truss” and “wood truss component” refer to open web load carrying assemblies suitable for support of roof decks or floors in buildings.
- B. MANUFACTURER: A manufacturer who is regularly engaged in design and fabrication of wood truss components.
- C. TRUSS INSTALLER: Builder, contractor or sub-contractor who is responsible for the field storage, handling and installation of trusses.

#### 1.04 SUBMITTALS:

- A. The manufacturer shall furnish shop drawings bearing seal, registration number, date and signature of the structural engineer licensed in state where trusses are to be installed who is in responsible charge of the truss design. Shop drawings shall include roof framing plans indicating placement and spacing of all trusses. A letter of certification from the truss manufacturer shall also accompany the truss shop drawing confirming the capacity of the metal gusset plate used in fabrication of the trusses. Shop drawings shall specify all special requirements of the truss manufacturer where trusses support conventional framing above. Drawings shall be approved by the Architect prior to fabrication.
- B. Preservation treated wood: Submit certification for waterborne preservative that moisture content was reduced to moisture content specified elsewhere in this section.
- C. Truss shop drawings shall include as a minimum the following information:
  - 1. Span, depth or slope and spacing of trusses;
  - 2. Required bearing width at supports;
  - 3. Design loads, as applicable:
    - a. Top chord live load;
    - b. Top chord snow drift loads as required by the Code;
    - c. Top chord dead load;
    - d. Bottom chord live load
    - e. Bottom chord dead load;

- f. Concentrated loads and their points of application; and
  - g. Wind and seismic criteria and loads.
- 4. Adjustment to lumber and plate design loads for condition of use;
- 5. Reactive forces, their points of occurrence and direction;
- 6. Metal connection plate type, gage, size and location of plate at each joint;
- 7. Lumber size, species and grade for each member;
- 8. Location of any required continuous lateral bracing;
- 9. Calculated deflection ratio and/or maximum deflection for live and total load
- 10. Camber to be built into each truss;
- 11. Maximum axial forces in truss members;
- 12. Location of joints;
- 13. Connection requirements for:
  - a. Truss to truss girders;
  - b. Truss ply to ply; and
  - c. Field splices.
  - d. Truss to structure
- D. Erection plans that accompany truss drawing submittals shall also be signed and sealed by the Structural Engineer who designs the individual truss components.
- E. Submittals shall include the following note completed and signed by the Contractor: "The data submitted does not contain material deviation from requirements of contract documents except as follow:"
- 1.05 REFERENCES:
- A. Applicable Standards:
  - 1. American Plywood Association (APA), current standards.
  - 2. American Society for Testing and Materials (ASTM), standards as referenced herein.
  - 3. American Wood Preservers Association (AWPA), standards as referenced herein.
  - 4. Product Standards (PS) of the National Bureau of Standards, U.S. Department of Commerce, standards as follows:
    - a. Softwood lumber: PS 20-99.
    - b. Softwood plywood: PS 1-83.
  - 5. National Design Specifications for Wood Construction (NDS), current standards.
  - 6. Design Specifications for Metal Plate Connected Wood Trusses (ANSI/TPI 1), Truss Plate Institute (TPI)
  - 7. Local code of jurisdiction.
- B. Grading rules; current rules of the following associations applicable to wood materials:

1. Southern Pine Inspection Bureau (SPIB).
2. Western Wood Products Association (WWPA).
3. West Coast Lumber Inspection Bureau (WCLIB).
4. National Lumber Grades Authority (NLGA).

#### 1.06 QUALITY ASSURANCE:

##### A. Product identification:

1. Lumber: Lumber shall bear the grade stamp of a listed grading rules association certified by the Board of Review of the American Lumber Standards Committee (ALSC), identifying species or species combination, grade, moisture content at time of surfacing, mill origin and grading agency.
2. Plywood: Plywood shall bear the stamp of the American Plywood Association (APA), indicating type, grade, thickness, exposure durability, span rating, species group, edging, surface finish, and regulatory agency compliance.
3. Pressure-preservative-treated wood materials: Pressure-preservative-treated lumber and plywood shall bear the quality standard stamp of the applicator indicating compliance with AWP standards, preservative type used, retention level, exposure conditions, treating company and plant location, year of treatment and name of certified treatment inspection agency.

#### 1.07 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials to project site and place in areas protected from the weather.
- B. Store materials minimum 6" off of ground or floor on level blocking. Cover with waterproof sheets or tarps if stored outdoors. Provide for adequate air circulation and ventilation when covering materials.
- C. Do not store seasoned materials in wet or damp areas of building.
- D. Protect edges, ends, corners and surfaces of sheet materials from damage.
- E. Remove all damage material from the site to prevent inadvertent use.

## 2 PART II PRODUCTS

#### 2.01 MATERIALS:

##### A. Lumber

1. Lumber used for truss members shall be in accordance with published values of lumber rules writing agencies approved by board of review of American Lumber Standards Committee. Lumber shall be identified by Grade mark of a lumber inspection bureau or agency approved by that Board, and shall be as shown on truss shop drawings.
2. Moisture content of lumber shall be no less than 7 percent nor greater than 19 percent at time of fabrication.
3. Allowable design stresses shall be in accordance with the Design Values for Wood Construction Supplement to the *National Design Specification for Wood Construction (NDS)* produced by the American Forest and Paper Association. Adjustment of values for duration of load or conditions of use shall be in accordance with NDS.
4. Fire retardant treated lumber, if applicable, shall meet specifications of truss design and ANSI/TPI 1-1995, par 9.1.5 and shall be redried after treatment in accordance with AWP

Standard C20. Allowable values must be adjusted in accordance with NDS par 2.3.6. Lumber treater shall supply certificate of compliance.

B. Metal connector plates:

1. Metal connector plates shall be fabricated by a firm which is a member of TPI and which complies with TPI quality control procedures for the manufacture of connector plates as published in TPI "Quality Control Manual." Plates shall be not less than .036 inches in thickness (20 gage). Plates shall meet or exceed ASTM A653-94 grade 37, and shall be hot dipped galvanized according to ASTM A653-94, coating designation G60. Working stresses in steel are to be applied to effective ratios for plates as determined by test in accordance with Appendix E and F of ANSI/TPI 1-1995.
2. In highly corrosive environments, special applied coatings or stainless steel may be required.
3. Indicate recommended values for load as established by the manufacturer on the shop drawings.
4. Metal connection plate manufacturer shall furnish a certified record that materials comply with steel specifications.

C. Other fasteners:

1. Nails: Common wire nails, finishing nails, and cement coated nails in accordance with Fed. Spec. FF-N-1 05. Use coated nails for exterior nailing. Use galvanized nails where nails are in contact with pressure treated wood.
2. Bolts, washers and nuts: Commercial quality steel. Galvanized where used on exterior or in contact with pressure treated lumber.

2.02 FABRICATION:

- A. Trusses shall be fabricated in a properly equipped manufacturing facility of a permanent nature. Trusses shall be manufactured by experienced workers, using precision cutting, jigging and pressing equipment meeting requirements of ANSI/TPI 1-1995, Section 4. Truss members shall be accurately cut to length, angle, and true to line to assure proper fitting joints within tolerances set forth in ANSI/TPI 1-1995, Section 4, and proper fit with other work.

3 PART III EXECUTION

3.01 PREFABRICATED WOOD TRUSSES:

- A. Design trusses for the dead and live loads shown on the Structural Drawings and in accordance with the defined allowable stresses.
- B. Fabrication: Cut truss members to accurate lengths, angles, and sizes to produce close fitting joints with wood-to-wood bearing in assembled units. Assemble truss members in design configuration using jigs or other means to ensure uniformity and accuracy of assembly with close fitting joints.
- C. Trusses shall be handled during fabrication, delivery and at the jobsite so as not to be subjected to excessive bending.
- D. Trusses shall be unloaded on smooth ground to avoid lateral strain. Trusses shall be protected from damage that might result from on-site activities and environmental conditions. Prevent toppling when banding is removed. Apparent damage to trusses, if any, shall be reported to Manufacturer prior to installation.

- E. Hoist units in place by means of lifting equipment suited to sizes and types of trusses required, applied at designated lift points as recommended by fabricator, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
- F. Erect and brace trusses to comply with recommendations of manufacturer and the Truss Plate Institute. Handle during installation in accordance with Handling, Installing and Bracing Wood Trusses (HIB-91), TPI, and ANSI/TPI 1-1995. Installation shall be consistent with good workmanship and good building practices and shall be responsibility of Truss Installer.
- G. Erect trusses with plane of truss webs vertical (plumb) and parallel to each other, located accurately at design spacing and location indicated. Trusses shall be held in correct alignment until specified permanent bracing is installed.
- H. Provide temporary bracing as required to maintain trusses plumb, parallel and in the location indicated until permanent bracing is installed. Erection bracing is always required. Professional advice should always be sought to prevent toppling or dominoing of trusses during installation. The Contractor is responsible for obtaining and furnishing the materials used for installation and all permanent bracing.
- I. Anchor trusses securely at all bearing points to comply with methods and details indicated on shop drawings.
- J. Concentrated loads shall not be placed atop trusses until all specified bracing has been installed and decking is permanently nailed in place. Specifically avoid stacking full bundles of decking or other heavy materials onto unsheathed trusses. Do not at any time put construction loads on the trusses which exceed their design capacity.
- K. Install permanent bracing and related components to enable trusses to maintain design spacing.
- L. Cutting and altering of trusses is not permitted.

### 3.02 METAL GUSSET PLATES:

- A. Press plates into members to obtain full penetration without crushing outer surface of wood.
- B. A stress increase for the value of a connector for duration of loading or other factors will not be allowed in any case.
- C. Increase metal gusset plates except for scissor trusses 25 percent in capacity over and above that which is required for calculated stresses and balance on joint as forces require. Minimum bite of 2-1/2" on tension member.
- D. Dimension exact location of each connector in joint.
- E. Construct scissor trusses with gusset plates 1-1/2 times capacity required by stresses.
- F. Splices in bottom or top chords shall occur at a joint.
- G. Where more than one member meets at a joint, only one gusset plate per side of truss is allowed.
- H. Job applied pressed metal plates shall be installed with the same pressure used in shop application.

### 3.03 CLEAN-UP:

- A. Clean up debris and excess materials from this work and remove from site. Leave area broom clean.

End of Section

## SECTION 06 20 20 - FINISH CARPENTRY:

### 1 PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials, equipment, and supervision necessary to fabricate and provide finish carpentry work as shown on the drawings and specified herein.
- B. See drawings, schedules, and details for location, quantity and design of finish carpentry required.
- C. Finish Carpentry, as included in this section, is defined as follows, except as otherwise specifically noted:

Exterior standing and running trim.

Interior standing and running trim.

All other finished exterior and interior woodwork exposed to view in the finished building unless noted otherwise.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 06 10 00 Rough Carpentry

Section 09 90 00 Painting

#### 1.03 SUBMITTALS:

- A. Submit shop drawings illustrating configuration and grade of all components of shop fabricated items.
- B. Submit product data for each type of factory-fabricated product and process specified, including details of construction relative to materials, dimensions of individual components, profiles, textures, and colors.
- C. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated material.
  - 1. For each type of preservative-treated wood product include certification by treating plant stating type of preservative solution and process used, net amount of preservatives retained, and compliance with applicable standards.
  - 2. For water-borne treated products include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.
  - 3. For fire-retardant treated wood products, include certification by treating plant that treated materials comply with specified standard and other requirements.
- D. Samples for verification of the following:
  - 1. Lumber and panel products with non-factory applied finish, 50 sq. in. for lumber and 8 by 10 inches for panels for each species and cut, with one-half of exposed surface finished.
  - 2. Lumber and panel products with factory-applied finish, 50 sq. in. for lumber and 8 by 10 inches for panels for each finish system and color.

#### 1.04 QUALITY ASSURANCE:

- A. Workmanship shall be of the best customarily done on work of this type. The intent is that joints be neatly and carefully made, surfaces straight and clean, work sanded with grain, all machine marks removed by sanding, except on exterior material which shall be cleanly machined. All cross scratches shall be eliminated. Shop assembled surfaces shall be glued where possible and shall be glue-blocked at concealed locations.
- B. Engage an experienced Installer who has completed finish carpentry similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance

1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.
- B. Do not deliver interior finish carpentry until environmental conditions meet requirements specified for installation areas. If finish carpentry must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

1.06 PROJECT CONDITIONS:

- A. Do not deliver or install interior finish carpentry until building is enclosed and weatherproof, wet-work in space is completed and nominally dry, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels through the remainder of the construction period.
- B. Proceed with installing exterior finish carpentry only when existing and forecasted weather conditions will permit work to be performed according to manufacturer's recommendations and warranty requirements and at least one coat of specified finish to be applied without exposure to rain, snow, or dampness.

2 PART II PRODUCTS

2.01 MATERIALS:

- A. Comply with DOC PS 20 "American Softwood Lumber Standard", for lumber and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee Board of Review.
- B. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade species, moisture content at time of surfacing and mill. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece, or omit grade stamps entirely and provide certificates of grade compliance issued by inspection agency.
- C. Softwood Plywood: Comply with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood".
- D. Hardwood Plywood: Comply with HPVA AP-1, "Interim Voluntary Standard for Hardwood and Decorative Plywood".
- E. Finish Plywood exposed on the exterior of the building shall be Hardwood Plywood.

2.02 INTERIOR FINISHED WOODWORK:

- A. Maximum moisture content for finish woodwork = 10% at time of fabrication.



- B. Lumber Trim for Opaque Finish (Painted): Finished lumber (S4S), either finger-jointed or solid lumber, one of the following species and grades:
1. Grade Finish or 1 Common eastern white pine; NELMA or NLGA.
  2. Grade 1 Common (Colonial)Idaho white, lodgepole, ponderosa, or sugar pine; NLGA or WWPA.
  3. Grade 1 Common white woods; WWPA.
  4. Grade Superior or C & Btr finish, Douglas fir-larch or Douglas fir south; NLGA, WCLIB, or WWPA.
  5. Grade 1 Common spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.
- C. All Miscellaneous millwork shall have all exterior corners made with shoulder and mitre joints. Millwork shall be scribed to fit wall as required.
- D. Moldings and Casings: Wood moldings and casings made from kiln-dried stock and graded under WMMPA WM 4.
1. Moldings where indicated to receive opaque finish (Painted): P-grade eastern white, Idaho white, lodgepole, ponderosa, or sugar pine.
  2. All door and window casings shall be similar to, and equal or greater in all dimensions to, Koetter Woodworking Casing Profile 24112-C-CA.

#### 2.03 MISCELLANEOUS MATERIALS:

- A. Fasteners for Exterior Finish Carpentry: Provide nails or screws of the following materials, in sufficient length to penetrate minimum of 1-1/2 inches (38 mm) into substrate, unless otherwise recommended by manufacturer:
1. Hot-dip galvanized steel.
  2. Prefinished aluminum in color to match stain, where face fastening of material to receive stain is unavoidable.
- B. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.
1. Where finish carpentry materials are exposed in areas of high humidity, provide fasteners and anchorages with hot-dip galvanized coating complying with ASTM A 153/A 153M.
- C. Paneling Adhesives: Comply with paneling manufacturer's written recommendations for adhesives.
- D. Glue: Aliphatic- or phenolic-resin wood glue recommended by manufacturer for general carpentry use.
- E. Flashing: Comply with requirements in Division 7 "Flashing and Sheet Metal" for flashing materials installed in finish carpentry.
- F. Sealants: Comply with requirements in Division 7 "Sealants and Caulking" for materials required for sealing siding work.

#### 2.04 FABRICATION:

- A. Wood Moisture Content: Comply with requirements of specified inspection agencies and with manufacturer's written recommendations for moisture content of finish carpentry at relative humidity conditions existing during time of fabrication and in installation areas.
- B. Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16 inch (1.5 mm) radius and edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8 inch (3 mm) radius.

### 3 PART III EXECUTION

#### 3.01 EXAMINATION:

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.02 PREPARATION:

- A. Clean substrates of projections and substances detrimental to application.
- B. Before installing finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours[, unless longer conditioning is recommended by manufacturer].
  - 1. Prime lumber for exterior applications to be painted, including both faces and edges. Cut to required lengths and prime ends. Comply with requirements in Division 9 Section "Painting."

#### 3.03 INSTALLATION, GENERAL:

- A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.
  - 1. Install finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
    - a. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
    - b. Countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.
    - c. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining finish carpentry with 1/32 inch (0.8 mm) maximum offset for flush installation and 1/16 inch (1.5 mm) maximum offset for reveal installation.
    - d. Coordinate finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate finish carpentry.
- B. Joints shall be tight and formed to conceal shrinkage. Drill pilot holes in hardwood finish subject to splitting. Running trim shall be in as long a length as possible and shall be jointed only at solid bearing.
- C. Running trim shall be in long lengths and jointed only where solid fastenings can be made. In all items which are not shop assembled, distribute to the best overall advantage those defects which are allowed in the grade of material specified.
- D. Finish Carpentry shall be of the best quality customarily done on work of this type. The intent is that joints be neatly and carefully made, surfaces straight and clean, work sanded with grain, all

machine marks removed by sanding. Shop assembled surfaces shall be glued where possible and shall be glue-blocked at concealed locations. All work shall conform to the quality standards of the AWI for custom grade.

- E. Back-priming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to surfaces installed in contact with concrete or masonry and to end-grain surfaces.

#### 3.04 STANDING AND RUNNING TRIM INSTALLATION:

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

1. Match color and grain pattern across joints.
2. Install trim after gypsum board joint finishing operations are completed.
3. Drill pilot holes in hardwood before fastening to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.
4. Fit exterior joints to exclude water. Apply flat grain lumber with bark side exposed to weather.
5. Finish: Apply finish within two weeks of installation.

#### 3.05 ADJUSTING:

- A. Replace finish carpentry that is damaged or does not comply with requirements. Finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

#### 3.06 CLEANING:

- A. Clean finish carpentry on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

End of Section

## SECTION 06 60 00 – PLASTIC FABRICATIONS

### PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials, equipment and supervision necessary to perform all work to install cellular PVC trim boards for architectural millwork as shown on the drawings as necessary to complete the work.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section	06 10 00	Rough Carpentry
Section	09 91 00	Painting

#### 1.03 SUBMITTALS:

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 submittal procedures section.
- B. Product Data: Submit product data, manufacturer's catalogs for specified products.
- C. Samples: Submit three material samples representative of the texture, thickness and widths shown and specified herein.

#### 1.04 REFERENCES:

- A. American Society for Testing and Materials (ASTM)
  - 1. ASTM D792 - Density and Specific Gravity of Plastics by Displacement.
  - 2. ASTM D570 - Water Absorption of Plastics.
  - 3. ASTM D638 - Tensile Properties of Plastics.
  - 4. ASTM D790 - Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
  - 5. ASTM D1761 - Mechanical Fasteners in Wood.
  - 6. ASTM D5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by means of a Striker Impacted by a Falling Weight.
  - 7. ASTM D256 - Determining the Pendulum Impact Resistance of Plastics.
  - 8. ASTM D696 - Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a vitreous silica dilatometer.
  - 9. ASTM D635 - Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
  - 10. ASTM E84 - Surface Burning Characteristics of Building Materials.
  - 11. ASTM D648 - Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
  - 12. ASTM D3679 - Standard Specification for Rigid Poly Vinyl Chloride (PVC) Siding.

#### 1.05 QUALITY ASSURANCE:

- A. Regulatory Requirements: Check with Local Building Code for installation requirements.
- B. Allowable Tolerances:
  - 1. Variation in component length: -0.00 / +1.00"
  - 2. Variation in component width: ± 1/16"

3. Variation in component thickness:  $\pm 1/16"$
4. Variation in component edge cut:  $\pm 2^\circ$
5. Variation in Density -0% + 10%

C. Workmanship, Finish, and Appearance:

1. Free foam cellular PVC shall be homogeneous and free of voids, holes, cracks, and foreign inclusions and other defects. Edges must be square. Top and bottom surfaces shall be flat with no convex or concave deviation.
2. Uniform surface free from cupping, warping, and twisting.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Trim materials should be stored on a flat and level surface on a full shipping pallet. Handle materials to prevent damage to product edges and corners. Store materials under a protective covering to prevent jobsite dirt and residue from collecting on the boards.

1.07 WARRANTY:

- A. Provide manufacturer's 25 year warranty against defects in manufacturing that cause the products to rot, corrode, delaminate, or excessively swell from moisture.

PART II PRODUCTS

2.01 MATERIALS:

A. Acceptable manufacturers:

1. Wyton, Ltd.
2. AZEK Building Products
3. Kleer Lumber
4. Other manufacturers approved by Architect prior to Bidding.

B. Material: Free foam cellular PVC material with a small-cell microstructure having the following minimum characteristics (per the indicated ASTM testing method):

1. Density g/cm<sup>3</sup> 0.55 (D 792)
2. Water Absorption % 0.15 (D 570)
3. Tensile Strength psi 2256 (D 638)
4. Tensile Modulus psi 144,000 (D 638)
5. Flexural Strength psi 3329 (D 790)
6. Flexural Modulus psi 144,219 (D 790)
7. Nail Hold Lbf/in of penetration 35 (D 1761)
8. Screw Hold Lbf/in of penetration 680 (D 1761)
9. Staple Hold Lbf/in of penetration 180 (D 1761)
10. Gardner Impact in-lbs 103 (D 5420)
11. Charpy Impact (@23°C) ft-lbs 4.5 (D 256)
12. Coefficient of Linear Expansion in/in/°F  $3.2 \times 10^{-5}$  (D 696)
13. Burning Rate in/min No burn (when D 635 flame removed)
14. Flame Spread Index -- 25 (E 84)
15. Heat Deflection Temp 264 psi °F 150 (D 648)
16. Oil Canning (@140°F) °F Passed (D 648)

2.02 ACCESSORY PRODUCTS:

A. Fasteners:

1. Use fasteners designed for wood trim and wood siding (thinner shank, blunt point, full round head).
2. Use a highly durable fastener such as stainless steel or hot-dipped galvanized.
3. Staples, small brads and wire nails must not be used as fastening members.
4. The fasteners should be long enough to penetrate the solid wood substrate a minimum of 1 1/2".
5. Standard nail guns work well with PVC trim products.
6. Use 2 fasteners per every framing member for trimboards applications. Trimboards 12" or wider, as well as sheets, will require additional fasteners.
7. Fasteners must be installed no more than 2" from the end of each board.
8. PVC trim products should be fastened into a flat, solid substrate. Fastening PVC trim products into hollow or uneven areas must be avoided.
9. Pre-drilling is typically not required unless a large fastener is used or product is installed in low temperatures.
10. Do not rip 3/8" and 1/2" sheet product into trim pieces. Sheet material must be glued to a substrate and mechanically fastened.

B. Adhesives:

1. Glue all PVC trim products joints such as window surrounds, long fascia runs, etc. with a cellular PVC cement, to prevent joint separation.
2. The glue joint should be secured with a fastener and/or fastened on each side of the joint to allow adequate bonding time.
3. Adhesive has a working time of 10 minutes and will be fully cured in 24 hours.
4. Non-cellular PVC cements are not to be used.
5. Surfaces to be glued should be smooth, clean and in complete contact with each other.
6. To bond to other substrates, various adhesives may be used. Consult adhesive manufacturer to determine suitability.

C. Sealants: Use urethane, polyurethane or acrylic based sealants without silicone.

2.03 FINISHES:

A. Preparation for Painting:

1. Surface must be clean and dry.
2. Fill nail holes with polyurethane or acrylic based caulk.
3. Use a 100% acrylic latex paint with a Light Reflective Value (LRV) of 55 or higher.
4. Follow the paint manufacturer's recommendations to apply.

PART III EXECUTION

3.01 INSTALLATION:

- A. Comply with manufacturer's product catalog installation instructions and product technical bulletin instructions.
- B. Do not damage adjacent work in place.
- C. Cutting:
  1. Cellular PVC products can be cut using the same tools used to cut lumber.
  2. Carbide tipped blades designed to cut wood work well. Avoid fine tooth metal cutting blades.
  3. Rough edges from cutting may be caused by excessive friction, poor board support, or worn or improper tooling.
- D. Drilling:

1. Cellular PVC products can be drilled using the same tools used to drill lumber.
2. Drilling is similar to drilling a hardwood. Care should be taken to avoid frictional heat buildup.
3. Use standard woodworking drills. Do not use drills made for normal rigid PVC.
4. Periodic removal of shavings from the drill hole may be necessary.

E. Milling:

1. Products can be milled using standard milling machines used to mill lumber.
2. Relief Angle 20° to 30°
3. Cutting speed to be optimized with the number of knives and feed rate.

F. Routing:

1. Cellular PVC products can be routed using standard router bits and the same tools used to rout lumber.
2. Carbide tipped router bits are recommended.
3. Edge Finishing: Edges can be finished by sanding, grinding or filing with traditional woodworking tools.

G. Nail Location:

1. Use 2 fasteners per every framing member for trimboard applications.
2. Trimboards 12" or wider, as well as sheets, require additional fasteners.
3. Fasteners must be installed no more than 2" from the end of each board.

H. Thermal Expansion and Contraction:

1. Properly fastening material along its entire length will minimize expansion and contraction.
2. When properly fastened, allow for 1/8" per 18 foot of product for expansion and contraction.
3. Joints between pieces should be glued to eliminate joint separation. When gaps are glued on a long run, allow expansion and contraction at ends of the run.

3.02 ADJUSTING:

- A. Replace material that is damaged or does not comply with requirements. Finished work may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.03 CLEANING AND PROTECTION

- A. Clean all dirt and debris from work in accordance with manufacturer's recommendations.
- B. Remove all dirt and debris from work area and adjacent areas.
- C. Protect surfaces from damage until date of substantial completion. Repair work or replace damaged work, which cannot be repaired to Architect's satisfaction.

End of Section

## SECTION 06 72 00 – PVC RAILINGS

### 1PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, equipment and supervision necessary to provide and install PVC Railings and column covers as herein specified and shown on the drawings as necessary to complete the work.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 09 91 00 Painting

#### 1.03 DEFINITIONS:

- A Posts are the vertical structure support members of the guardrail system.
- B Rails are the horizontal structural support members of the guardrail system.
- C Aluminum Channel - Structural supports inside rails.
- D Pickets are the vertical members between bottom and top rails.
- E Post Support Kits are the non-PVC steel structural supports inside of vinyl posts.

#### 1.04 SUBMITTALS:

- A General: Submit the following according to the conditions of the contract.
- B Product Data: In the form of manufacturer's technical data, specifications, and installations for guardrail, posts, post caps, and accessories.
  - 1. and to transfer this load through supports to the structure.
- C Samples for verification of PVC color in form of 3-inch lengths of actual product to be used in color selection.
- D Shop Drawings showing guardrail design.

#### 1.05 QUALITY ASSURANCE:

- A Installer Qualifications: Engage an experienced installer who has at least three years experience and has completed at least five PVC guardrail projects with same material and of similar scope to that indicated for this project with a successful construction record of in-service performance.
- B Single-Source Responsibility: Obtain PVC guardrail accessories, fittings, and fastenings, from a single source.

#### 1.06 PROJECT CONDITIONS:

- A Field Measurements: Verify layout information for guardrail shown on the drawings in relation to the property survey and existing structures. Verify dimensions by field measurements.

#### 1.07 WARRANTY:



- A Manufacturer's Warranty: 30 year non-prorated limited warranty.

## 2PART II PRODUCTS

### 2.01 GUARDRAIL MATERIALS:

- A General: Provide PVC guardrail materials recognized to be of type indicated and tested to show compliance with indicated performances, NES, ICC: IBC & IRC, and local building codes.
- B Available Manufacturer: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include:
1. (Style R) Bread Loaf profile rail with square pickets as manufactured by Tek-Rail Inc., Bldg B, 320 Temple Ave., Newnan, GA 30263, Phone: (800) 983-5724
- Or equivalent products by the following manufacturers:
2. Certain Teed, 2525 Walden Avenue, Buffalo, NY 14225, Phone: (800) 333-0569
  3. Alside / Ultragaurd, 3773 State Rd., Cuyahoga Falls, OH 44223, Phone: (800) 457-4342
  4. L.B. Plastics, Inc., 482 East Plaza Dr., Mooresville, NC 28115, Phone: (800) 752-7739
  5. Additional manufacturers must be approved by Architect prior to bidding.

### 2.02 POLYVINYL CHLORIDE (PVC) GUARDRAIL COMPONENTS

- A General: Posts, rails, pickets, post caps, and accessories shall be of high impact, Ultra Violet (U.V.) resistant, rigid PVC, and shall comply with ASTM D 1784, Class 14344B.
- B Posts: One piece extruded, of lengths indicated and pre-routed to receive rails at spacing indicated on drawings.
- C Rails: One piece extruded, of lengths indicated pre-routed to receive pickets at spacing indicated on drawings.
- D Pickets: One piece square extruded or reformed extrusion of lengths indicated on drawings.
- E Post Caps: Molded
1. Cross Section: Match post cross section.
  2. Configuration: Flat or four-sided as required for installation to top of posts.
- F Wall mount: One piece U-shape to mate with rail inserts.
- G Accessories: Manufacturers' standard screw caps, rail & post trim pieces, and other accessories as required.
- H Color: As selected by the Architect from the manufacturer's full range.

### 2.03 MISCELLANEOUS MATERIALS:

- A Post Support Kits: Galvanized steel post 1-5/8" SS40 type extending from attachment surface for concrete or substructure of wood deck to above top rail of guardrail. Aluminum post brackets and stainless steel rail lock plates to fit over pipe, including all necessary hardware to attach to wood deck substructure or concrete surface.
- B Stiffener Channels: Extruded aluminum structural channel. Configure channels for concealed installation within PVC rails.

- C Fasteners: Stainless Steel. All fasteners to be concealed or colored heads to match. Provide sizes as recommended by manufacturer
- D Column covers to have concealed fastening system and base trim at top and bottom.
- E Required trim not furnished prefabricated by the manufacturer shall be fabricated by the Contractor from Cellular PVC. Acceptable material is Azek as distributed by Vycom Corp., 801 E. Corey St., Scranton, PA 18505, Phone: (800) 235-8320. Additional manufacturers must be approved by Architect prior to bidding.

### 3PART III EXECUTION

#### 3.01 INSTALLATION, GENERAL:

- A Install guardrail in locations shown in compliance with manufacturer's written instructions. During installation, PVC components shall be carefully handled and stored to avoid contact with abrasive surfaces. Install components in sequence as recommended by manufacturer.
  - 1. Install guardrail as indicated on the drawings provided.
  - 2. Variations from the guardrail installation indicated and all costs for removal and replacement will be the responsibility of the contractor.

#### 3.02 GUARDRAIL INSTALLATION:

- A Post Support Kits: To be attached to concrete surface or wood deck using hardware supplied by manufacturer and following all recommended manufacturer installation instructions at positions indicated on drawings.
- B Post Brackets: Install one set at position below each routed hole to act as spacer between steel pipe and vinyl post as per manufacturer recommendations.
- C Posts: Install over steel or wood post in one piece, plumb and in line.
- D Top and Bottom Rails: Install rails in one piece into routed hole fabricated into posts to receive top and bottom rails. Except on stairs and ramps, install rails level.
  - 1. Prior to installation of rails into posts, insert concealed aluminum channel stiffeners in top and bottom rails.
- E Pickets: Install pickets in one piece as per manufacturer recommendations. Install pickets plumb.
- F Rail Lock Plate: After top rail is installed, place rail lock plate over post support pipe and rest on top of rail. Secure with screw to lock top rail in place.
- G Post Caps: Install either internal fit caps by pressing in place or use #8 screws, snap caps & washers to attach external caps.

#### 3.03 ADJUSTING AND CLEANING:

- A Remove all traces of dirt and soiled areas.

End of Section

## PART I GENERAL

A Furnish all labor, materials and equipment, and perform all work to install waterproofing and dampproofing as shown on the drawings and as specified herein.

1. Install waterproofing membrane and protection course at all walls below grade prior to backfilling.
2. Install mastic dampproofing on CMU walls behind brick veneer.
3. The Concrete Contractor shall furnish and install moisture barrier under concrete slabs, and waterstops in foundation and floor slabs.
4. The Masonry Contractor shall assist the Concrete Contractor with the installation of waterstops which bridge the intersection of concrete and masonry.

A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

A Submit manufacturer's specifications and installation instructions for waterproofing membrane, waterstops, and protection board.

A Provide a suitable area for storage of dampproofing materials and equipment. Store asphalt emulsion containers on end on wood or other clean rigid pad, to prevent adherence of foreign material.

B Any work or materials damaged during the handling and application of asphalt emulsion shall be restored to original condition or replaced at no additional cost to the Owner.

A All areas waterproofed are to be guaranteed during the one (1) year guarantee period. Any water leakage covered herein is to be repaired at the contractor's expense.

2.01 MATERIALS:

A      Waterproofing of wall areas below grade and decks above finished space shall be Bituthene System 4000 Waterproofing System as manufactured by Grace Construction Products, Mel-Rol® Waterproofing System as manufactured by W. R. Meadows, Inc. or product meeting or exceeding the following properties:

- |    |  |                     |
|----|--|---------------------|
| 1. | Thickness 1/16 in. (1.5 mm) nominal  | ASTM D3767—method A |
| 2. | Flexibility, 180° bend over 1 in. (25 mm) mandrel at -25°F (-32°C)Unaffected | ASTM D1970          |
| 3. | Tensile strength, membrane, die C 325 lbs/in.2 min.                          | ASTM D412 modified1 |
| 4. | Tensile strength, film 5,000 lbs/in.2 min.                                   | ASTM D882 modified1 |
| 5. | Elongation, ultimate failure of rubberized                                   |                     |

- |     |  |                                  |
|-----|--|----------------------------------|
|     | asphalt 300% min.  | ASTM D412 Modified               |
| 6.  | Crack cycling at -25°F (-32°C), Unaffected<br>100 cycles                                 | ASTM C836                        |
| 7.  | Lap adhesion at minimum application<br>temperature: 5 lbs/in. (880 N/m)                  | ASTM D1876 modified <sup>2</sup> |
| 8.  | Peel strength: 9 lbs/in. (1576 N/m)  | ASTM D903 modified <sup>3</sup>  |
| 9.  | Puncture resistance, membrane:<br>50 lbs (222 N) minimum                                 | ASTM E154                        |
| 10. | Resistance to hydrostatic head<br>210 ft (70 m) of water                                 | ASTM D5385                       |
| 11. | Permeance 0.05 perms maximum<br>method   | ASTM E96, section 12—water       |
| 12. | Water absorption 0.1% maximum  | ASTM D570                        |
| 13. | Surface treatment shall be Bituthene Surface Conditioner.                                |                                  |
| 14. | All waterproofing on walls below grade shall be protected by Bituthene Protection Board. |                                  |
- B Mastic dampproofing shall be asphalt emulsion type, Karnak 200 fibrated, manufactured by Karnak Chemical Corporation, Air-Shield™ LMP by W.R. Meadows, or Hydrocide 700 semi-mastic manufactured by Sonneborn Building Products, Division Contech, Inc.

### PART III EXECUTION

#### 3.01 SURFACE PREPARATION:

- A Surfaces to receive waterproofing shall be clean, dry, and free of voids, loose aggregate scale, and sharp projections.

#### 3.02 INSTALLATION OF WATERPROOFING ON WALLS:

- A Place Z-strips at footings.
- B At deck applications, adhere tape to wall to depth equivalent to the thickness of wearing slab.
- C Install waterproofing sheets as recommended by manufacturer.
- D Tape joints as recommended by manufacturer.
- E Clean and prepare subsurfaces in accordance with waterproofing manufacturers requirements.
- F Cover waterproofing on exterior walls with polystyrene on impaling pins.

#### 3.03 INSTALLATION OF WATERSTOPS:

- A Install in all walls below grade to bridge the gap between the wall and the slabs on grade.
- B All splicing connections shall be made in accordance with manufacturers recommendations.

#### 3.04 INSTALLATION OF DAMPPROOFING:

- A Apply mastic dampproofing to exterior face of exterior masonry wall which are to receive brick veneer, in one full coat over the block.
- B Fill all cracks, crevices, and pores of concrete. Make sure coating is continuous and free from breaks and pinholes.
- C Dampen the dry concrete surfaces and keep surface damp ahead of application.

End of Section

## SECTION 07 21 00 – BUILDING INSULATION

### PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish and install thermal insulation at all exterior cavity walls and batt insulation and insulation where noted on the drawings.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section	04 20 00	Unit Masonry
Section	09 29 00	Gypsum Wallboard
Section	09 51 13	Acoustic Treatment

#### 4.01 SUBMITALS

- A. Submit product data for all insulation products.

#### 4.02 DELIVERY, STORAGE, AND HANDLING:

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
  - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
  - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.
  - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

### PART II PRODUCTS

#### 5.01 MATERIAL:

- A. Insulation for exterior stud walls shall be 6" (R-19) FSK un-faced fiberglass batt insulation ASTM C665 Type III, Class A. Insulation shall be sized for friction fit between studs.
- B. Batt insulation at roof trusses shall be 14 inch (R-38) unfaced fiberglass batt insulation ASTM C 665 Type II, Class A.
- C. Batt insulation not covered by gypsum wallboard, or other code-approved substrate, shall be foil-faced, fire-resistant batt insulation complying with ASTM C 665, Type III, Class A, Category 1. Surface burning characteristics: Maximum flame spread: 25; Maximum smoke developed: 50, when tested in accordance with ASTM E 84.
- D. Perimeter foundation insulation shall be 1-1/2" thick rigid closed-cell board complying with ASTM C-578 Type IV with the following properties:
  - 1. Compressive Strength: 25 psi minimum
  - 2. Flexural Strength: 50lbs/in<sup>2</sup> min (ASTM C 203)
  - 3. Thermal Resistance: 5 year aged R-values of 5.4 and 5.0 min. °F-ft<sup>2</sup>-h/Btu<sup>2</sup>/inch at 40°F and 75°F respectively (ASTM C 518).

4. Water Absorption: max. 0.1% by volume (ASTM C 272).
5. Water Vapor Permeance: 1.1 perm-inch max.
6. Dimensional Stability: 2% max. linear change (ASTM D2126).
7. Flame Spread: 5 (ASTM E 84).
8. Smoke Developed: 45 to 165 (ASTM E84)
9. Size: manufacturer's standard lengths and widths.
10. Approved manufacturers include:

- A. DiversiFoam Products.
- B. Dow Chemical Company.
- C. Owens Corning.
- D. Pactiv, Building Products Division.

- E. Insulation for furred masonry walls "Z" furring shall be 1-1/2" thick rigid closed-cell board complying with ASTM C-578 Type IV with the following properties:

1. Compressive Strength: 15 psi minimum
2. Flexural Strength: 40lbs/in<sup>2</sup> min (ASTM C 203)
3. Thermal Resistance: 5 year aged R-values of 5.4 and 5.0 min. °F-ft<sup>2</sup>-h/Btu<sup>2</sup>/inch at 40°F and 75°F respectively (ASTM C 518).
4. Water Absorption: max. 1.1% by volume (ASTM C 272).
5. Water Vapor Permeance: 1.1 perm-inch max.
6. Dimensional Stability: 2% max. linear change (ASTM D2126).
7. Flame Spread: 5 (ASTM E 84).
8. Smoke DevelopedL 45 to 165 (ASTM E84)
9. Size: Furnished in boards 23-7/8" wide by manufacturer's standard lengths.
10. Approved manufacturers include:

- A. DiversiFoam Products.
- B. Dow Chemical Company.
- C. Owens Corning.
- D. Pactiv, Building Products Division.

- F. 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.

#### 5.02 VAPOR RETARDER:

- A. Polyethylene Vapor Retarder: 20-mil film ASTM D 4397with vapor transmission rating of 0.1 perms where noted on the drawings.

### PART III EXECUTION

#### 6.01 GENERAL:

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or that interfere with insulation attachment.
- B. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- C. Install insulation that is undamaged, dry, unsoiled, and has not been exposed at any time to ice or snow.
- D. 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.

- E. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

#### 6.02 INSTALLATION OF VAPOR RETARDERS

- A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Before installing vapor retarder, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
- C. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.
- D. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.
- E. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

#### 6.03 INSTALLATION OF BATT INSULATION:

- A. Set vapor-retarder faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
- B. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
- C. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:
  - 1. Use blanket widths and lengths that fill cavities formed by framing members. Where more than one length is required to fill the cavity, provide lengths that will produce a snug fit between studs.
  - 2. 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 with faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to produce air tight installation after concealing finish is in place.
  - 4. Stuff glass-fiber loose-fill insulation into miscellaneous voids and cavity spaces not large enough to receive batts. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

#### 6.04 INSTALLATION OF RIGID INSULATION AT FURRED MASONRY WALLS:

- A. Install wall insulation as follows:
  - 1. Install insulation boards vertically against backup wythe of masonry. Wedge insulation boards tightly between rows of metal furring stripes.
  - 2. Cut insulation by means of saw, knife, or similar sharp tool to fit around obstructions across the cavity such as vents, louvers, pipe, and conduit. Cut insulation to 8" widths and bevel edges to seal tightly at radius corners.

3. Coordinate the installation of insulation with the masonry work. Be sure the dampproofing or waterproofing is in place on face of backup before insulation is installed.

6.05 CLEAN UP:

- A. Remove all debris and unused insulation products from the site.

6.06 PROTECTION:

- A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

End of Section



## SECTION 07 31 13 – FIBERGLASS SHINGLES

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, tools, equipment and services required to install new shingle roofing and felt.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 07 62 00 Flashing and Sheet Metal

#### 1.03 SUBMITTALS:

- A Submit shingle samples for color selection by the Architect.

#### 1.04 WARRANTY:

- A Warranty shall be manufacturer's standard 25-year (minimum) limited warranty.
- B In addition to manufacturer's limited warranty on materials, provide manufacturer's 10 year non-prorated warranty covering labor and materials

### PART II PRODUCTS

#### 2.01 MANUFACTURERS:

- A Manufacturers: Subject to compliance with requirements, provide asphalt shingles produced by one of the following:
1. CertainTeed Corporation.
  2. Custom Roofing Company.
  3. Elk Corporation of America.
  4. GAF Building Materials Corporation.
  5. Georgia-Pacific Corp.
  6. Owens-Corning Fiberglas Corp.
  7. Tamko Asphalt Products, Inc.
- B Manufacturers: Subject to compliance with requirements, provide Waterproof Underlayment produced by one of the following:
1. WinterGuard; CertainTeed Corporation.
  2. Bituthene Ice and Water Shield; Grace: W.R. Grace & Co.
  3. Nordshield Ice and WaterGard; Nord Bitumi US, Inc.
  4. Polyguard Deck Guard; Polyguard Products, Inc.
  5. Polyken 640 Underlayment Membrane; Polyken Technologies; Kendall Co. Division.
  6. QSC-707; Quaker Construction Products, Inc.
  7. Moisture Guard; Tamko Asphalt Products, Inc.

#### 2.02 ASPHALT SHINGLES

- A Colors, Blends, and Patterns: Where manufacturer's standard products are indicated, provide asphalt shingles with the following requirements:

1. Provide Architect's selections from manufacturer's full range of colors, textures, and patterns for asphalt shingles of type indicated.
- B Dimensional, Fiberglass Strip Shingles: Mineral-surfaced, self-sealing, two piece laminated, fiberglass-based, strip asphalt shingles, complying with both ASTM D 3018, Type I, and ASTM D 3462. Provide shingles with a Class A fire-test-response classification that pass the wind-resistance-test requirements of ASTM D 3161.
1. Fungus Resistant: Provide shingles that have been surface treated to remain free of fungus and algae growth, which adversely affects the appearance of the roof, for at least 5 years.
- C Hip and Ridge Shingles: Manufacturer's standard, factory-precut units to match asphalt shingles.

#### 2.03 ACCESSORY MATERIALS:

- A Underlayment of shingles shall be 30-pound unperforated organic asphalt saturated roofing felt complying with ASTM D 226, 36 inches wide. This underlayment is a minimum. At no time shall an underlayment be installed which is not acceptable to the shingle manufacturer for specified warranty.
- B Eaves Protection: Sheet barrier which meets ASTM D1970 of self-adhering rubberized asphalt membrane shingle underlayment having internal reinforcement and "split" back plastic release film; provide material warranty equal in duration to that of shingles being applied.
- C Roofing cement shall be manufacturer's standard cement complying with ASTM D-2822.
- D Nails for shingles and underlayment shall be hot-dip galvanized barbed roofing nails, 12 gauge minimum with 3/8" diameter head, length to penetrate 3/4 inches into solid decking or to penetrate through plywood sheathing. Staples are prohibited.
- E Starter Course: Manufacturer's standard, color to match field shingles.

#### 2.04 RIDGE VENTS:

- A. Rigid Ridge Vent: Manufacturer's standard rigid section high-density polypropylene or other UV-stabilized plastic ridge vent with nonwoven geotextile filter strips and with external deflector baffles; for use under ridge shingles.
1. Acceptable Products:
    - a. Air Vent Inc., a CertainTeed Company; ShingleVent II.
    - b. Cor-A-Vent, Inc.; V-Series.
    - c. GAF Materials Corporation; Cobra Rigid Vent II.
    - d. Lomanco, Inc.; OR-4.
    - e. Owens Corning; VentSure Ridge Vent.
    - f. Ridglass Manufacturing Company, Inc.; Coolvent.
  2. Minimum Net Free Area: 18 square inches per lineal foot.
  3. Width: 12 inches.
  4. Thickness: 1 inch.

#### 2.05 METAL TRIM AND FLASHING:

- A Sheet Metal Materials: Furnish the following sheet metal materials:

1. Aluminum Sheets: ASTM B 209 alloy 3003 H14 with mill finish, minimum 0.024 inch thick unless otherwise indicated 18 inches wide minimum. Job cut to sizes and configurations recommended in Figure 4-10 of SMACNA manual fifth edition. If used in an open valley, configure to match Figure 4-9 SMACNA manual fifth edition. Provide 1 inch V crimp profile. Open valley flashing shall be prefinished to match shingle color.
- B Metal Drip Edge: Brake-formed sheet metal with at least a 2 inch roof deck flange and a 1-1/2 inch fascia flange with a 3/8 inch drip at lower edge. Furnish the following material in lengths of 8 or 10 feet.
  1. Material: Aluminum sheets.
- C Metal Flashing: Job-cut to sizes and configurations required.
  1. Material: Aluminum sheets.
- D Vent Pipe Flashing: Lead conforming to ASTM B 749, Type L51121, at least 1/16 inch thick, unless otherwise indicated. Provide lead sleeve sized to slip over and turn down into pipe 1 inch minimum, soldered to skirt at slope of roof extending at least 6 inches from pipe onto roof.
- E Vent Pipe Flashing: Thermoplastic pipe flashing
  1. 85300 Series as manufactured by Portals Plus, 639 Thomas Drive, Bensenville IL 60106, (630) 766-5240.
  2. Molded Polypropylene pipe flashing NPF Series as manufactured by The Never Leak Company LP, P.O. Box 1397, Olive Branch, MS 38654, (800) 274-2409.
- F. Mast Flashing: All electrical mast flashing shall be done with a zipper/split/wrap-around boot. Field splicing of standard boots are unacceptable.

### PART III EXECUTION

#### 4.01 EXAMINATION:

- A Examine substrate for compliance with requirements for substrates, installation tolerances, and other conditions affecting performance of asphalt shingles. Do not proceed with installation until unsatisfactory conditions have been corrected.

#### 4.02 PREPARATION:

- A Clean substrates of projections and substances detrimental to application. Cover knotholes or other minor voids in substrate with sheet metal flashing secured with non-corrosive roofing nails.
- B Coordinate installation with flashings and other adjoining work to ensure proper sequencing. Do not install roofing materials until all vent stacks and other penetrations through roof sheathing have been installed and are securely fastened against movement.

#### 4.03 SEQUENCE OF WORK:

- A The sequence of work in the various roof areas shall be such as to minimize construction traffic over completed roof areas.
- B Roofing materials shall be hoisted directly from grade to the roof level where roofing is to be installed and shall not be transported over existing roofs at roof levels below work areas.
- C No materials shall be stored or stacked on the roof deck in such a manner as to exceed a live load of 20 PSF.

#### 4.04 INSTALLATION:

- A General: Comply with manufacturer's instructions and recommendations but not less than those recommended by ARMA's "Residential Asphalt Roofing Manual" or "The NRCA Steep Roofing Manual."
1. Fasten asphalt shingles to roof sheathing with nails.
- B Felt Underlayment: Apply 1 layer of felt underlayment horizontally over entire surface to receive asphalt shingles, lapping succeeding courses a minimum of 2 inches, end laps a minimum of 4 inches, and hips and valleys a minimum of 6 inches. Fasten felt with sufficient number of roofing nails to hold underlayment in place until asphalt shingle installation.
1. Omit felt underlayment at areas of waterproof underlayment. Lap felt underlayment over waterproof underlayment as recommended by manufacturer but not less than 2 inches.
- C Waterproof Underlayment at Roof Overhang: Apply 1 layer of waterproof underlayment horizontally over surface of roof where soffit is exposed to weather. Beginning at eave and extending 1 foot minimum beyond wall line below, lap succeeding courses a minimum of 2 inches, end laps a minimum of 4 inches. Fasten waterproof underlayment with only enough roofing nails to hold underlayment in place until asphalt shingle installation. Lap roof underlayment over waterproof underlayment at least 6 inches.
- D Flashing: Install metal flashing and trim as indicated and according to details and recommendations of the "Asphalt Roofing" section of "The NRCA Steep Roofing Manual" and ARMA's "Residential Asphalt Roofing Manual."
- E Install asphalt shingles, beginning at roof's lower edge, with a starter strip of roll roofing or inverted asphalt shingles with tabs removed. Fasten asphalt shingles in the desired weather exposure pattern; use number of fasteners per shingle as recommended by manufacturer. Use vertical and horizontal chalk lines to ensure straight coursing.
1. Cut and fit asphalt shingles at valleys, ridges, and edges to provide maximum weather protection. Provide same weather exposure at ridges as specified for roof. Lap asphalt shingles at ridges to shed water away from direction of prevailing wind.
  2. Use fasteners at ridges of sufficient length to penetrate sheathing as specified.
  3. Pattern: Comply with manufacturer's recommendations for offset and exposure.

#### 4.05 RIDGE VENTS:

- A. Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.

#### 4.06 ADJUSTING:

- A Replace any damaged materials installed under this Section with new materials that meet specified requirements.

End of Section

## SECTION 07 46 40 – FIBER-CEMENT SIDING AND ACCESSORIES:

### PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials, equipment and supervision necessary to provide and install Fiber-Cement siding and accessories as shown on the drawings and specified herein.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section	07 21 00	Building Insulation
Section	07 62 00	Flashing and Sheet Metal
Section	07 92 00	Sealants and Caulking

#### 1.03 SUBMITTALS:

- A. Submit manufacturer's data illustrating configuration and installation directions.
- B. Submit actual 6" x 6" samples of products in textures and profiles specified for verification.

#### 1.04 QUALITY ASSURANCE:

- A. Engage an experienced installer who has completed siding installations similar in material, design, and extent to that indicated for Project that has resulted in construction with a record of successful in-service performance.

#### 1.05 PROJECT CONDITIONS:

- A. Lay JamesHardie claddings flat on a smooth, level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.
- B. Weather Conditions: Proceed with siding installation only when existing and forecasted weather conditions will permit siding to be installed in compliance with manufacturer's recommendations and when substrate is completely dry.

#### 1.06 WARRANTY:

- A. James Hardie's limited product warranty against manufacturing defects in Hardiplank siding for 30 years, and HardiTrim for 10 years.

### PART II PRODUCTS

#### 2.01 MANUFACTURER:

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to James Hardie Building Products Inc., 26300 LaAlameda, Suite 250, Mission Viejo, California 92691, Phone: (888)542-7343, info@JamesHardie.com

#### 2.02 FIBER-CEMENT SLAP SIDING:

- A. Non-asbestos fiber-cement siding to comply with ASTM Standard Specification C1186 Grade II, Type A.

- B. Siding to meet the following building code compliance National Evaluation Report No. NER 405 (ICC: IBC & IRC); City of Los Angeles, Research Report No. 24862; Metro Dade County, Florida Acceptance No. 94-1234.04; US Department of Housing and Urban Development Materials Release 1263a; California DSA PS-019; and City of New York MEA 223-93-M. Non-asbestos fiber-cement siding to be non-combustible when tested in accordance with ASTM test method E136.
- C. Type: Hardiplank 6.25", double run with 5" exposure each, Select Cedarmill or as specified on the Construction Drawings.
  - 1. Factory Primed on four sides with a mildew resistant primer.
  - 2. Color: To be selected by Architect from manufacturer's full range

2.03 FASTENERS:

- A. Metal Framing: 15/8" No. 8 – 18 c 0.0323" head self-drilling, corrosion resistant S-12 Buglehead screws.
- B. Fasteners: Non-corrosive aluminum siding nails in sufficient length to penetrate minimum of 1 inch into substrate. Provide prefinished fasteners in color to match siding where face nailing is unavoidable.

2.04 CORNER BOARDS AND TRIM ASSOCIATED WITH FIBER CEMENT SIDING:

- A. Composite wood product: Exterior grade, treated wood composite trim material.
- B. Basis of Specification: MiraTec® treated composite wood panels as manufactured by CMI/Jeld-Wen, 2645 Silver Crescent Drive, Charlotte, NC 28273 Phone: (800)535-3936.
- C. Boards:
  - 1. Material: Wood fibers combined with phenolic resins, zinc borate, and water repellent. Essentially formaldehyde free.
  - 2. Surface: Clear cedar texture one side, smooth the other. Primed 4 sides.
  - 3. Substrate: 1-piece solid substrate, uniform density, not laminated. No knots or voids.
  - 4. Thickness: 4/4
  - 5. Typical Properties, 4/4 Thickness:
    - a. Density, ASTM D 1037: 49 pounds per cubic foot.
    - b. Modulus of Rupture, ASTM D 1037: 3,900 psi.
  - 5. 24-Hour Soak, ASTM D 1037:
    - a. Water Absorption: 7.6 percent.
    - b. Thickness Swell: 1.9 percent.
  - 6. Accelerated Aging Test, 6-Cycle, ASTM D 1037: Retained 90 percent of original strength.
  - 7. Termite Resistance and Decay, AWWA E7 Rating Scale, 3-Year Exposure:

- a. Termite Resistance Score: 8.8 out of 10.
  - b. Termite Decay Score: 10 out of 10.
- 8. Rot Resistance, AWP E10:
  - a. White Rot: 3.66 percent weight loss.
  - b. Brown Rot: 1.02 percent weight loss.

### PART III EXECUTION

#### 3.01 EXAMINATION:

- A. Examine substrates for compliance with requirements for substrates, installation tolerances, and other conditions affecting performance of siding. Do not proceed with installation until unsatisfactory conditions have been corrected.

#### 3.02 PREPARATION:

- A. Clean substrates of projections and substrates detrimental to application.
- B. Coordinate installation with flashings and other adjoining construction to ensure proper sequencing.

#### 3.03 INSTALLATION OF HARDIPLANK SIDING:

- A. Substrate: Install Hardiplank siding over minimum 7/16 inch thick OSB wall sheathing or equivalently braced walls complying with the applicable building code.
- B. Starting: Install a minimum ¼ inch thick lath starter strip at the bottom course of wall.
- C. Maintain clearance between siding and adjacent finished grade.
- D. Apply starter course of 6 1/4 inch hardiplank lap siding over the starter strip.
- E. Apply subsequent courses horizontally using vinyl siding. See Section 07463.

#### 3.04 INSTALLATION OF COMPOSITE WOOD TRIM:

##### A. Cutting

- 1. Use a fine toothed hand saw or power saw with a combination blade.
- 2. Cut into exposed face of the material

##### B. Fastening

- 1. Double nail a maximum of 16. O.C. for all trim applications.
- 2. Double nail a maximum of 24. O.C. for fascia.
- 3. Do not nail into cut edge of material.
- 4. Nails must penetrate a minimum of 1 ¼. into framing member.
- 5. Fasten MiraTEC from one end to the other, do not nail towards the ends from center.

##### C. Butt Joints

- 1. All joints must fall over a framing member.

2. Space all butt and scarf joints 1/8. and apply sealant into the full depth of the 1/8. joint.
3. Double nail on both sides of joint, at least 1/2. from the edge.

#### D. Fasteners

1. Use nails with a 3/16. head diameter, long enough to penetrate 1 1/4. into structural framing member.
2. Use nails with performance equivalent to hot dipped galvanized or better (such as 304 SS).
3. Screws, ring shank nails, etc. can be used as long as they meet the same minimum performance criteria as above.
4. Tapered or bugle head fasteners are permitted when heads are properly seal from moisture.
5. Do not countersink fasteners more than 1/8.. All slightly counter sunk fasteners less than 1/8. should be filled with exterior putty and painted.

#### E. Flashing and Moisture Control

1. Do not apply trim to wet sheathing.
2. Do not apply trim closer than 6. to finished grade or landscaping.
3. Do not allow the trim to stand in water.
4. Do not allow direct contact with masonry or concrete. Properly flash and space a minimum of 1/2. from any concrete flatwork or horizontal brick ledge.
5. At foundations or brick veneer, the product should be separated from the masonry by metal flashing, polyethylene film, 30 lb. felt or a 1/4. to 1/2. air space using masonry standoffs.

#### F. Sealant

1. Do not allow water to stand on or leak behind any trim.
2. Sealant is required at butt joints and where trim abuts siding, windows, doors, or other materials.
3. Do not use hard-setting caulk. Rather, use exterior quality sealants that remain flexible over time.
4. Caulks and sealants that at a minimum meet ASTM C920 are recommended.

#### G. Machining

1. Do not machine or route the trim in excess of 5/16. depth.
2. Maintain a minimum angle of 100 degrees from the vertical to provide positive drainage.
3. Reprime all machined areas

#### 3.05 .ADJUSTING:

- A. Replace damaged siding materials with new materials complying with specified requirements.

#### 3.06 CLEANING:

- A. Clean finished surfaces as recommended by siding manufacturer, and maintain in a clean condition during construction.

End of Section



## SECTION 07 46 41 – FIBER-CEMENT PANELS AND ACCESSORIES:

### PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials, equipment and supervision necessary to provide and install Fiber-Cement panel siding and accessories as shown on the drawings and specified herein.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section	07 21 00	Building Insulation
Section	07 62 00	Flashing and Sheet Metal
Section	07 92 00	Sealants and Caulking

#### 1.03 SUBMITTALS:

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- B. Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.
- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

#### 1.04 QUALITY ASSURANCE:

- A. Engage an experienced installer who has completed siding installations similar in material, design, and extent to that indicated for Project that has resulted in construction with a record of successful in-service performance.

#### 1.05 PROJECT CONDITIONS:

- A. Lay claddings flat on a smooth, level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.
- B. Weather Conditions: Proceed with siding installation only when existing and forecasted weather conditions will permit siding to be installed in compliance with manufacturer's recommendations and when substrate is completely dry.
- C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### 1.06 WARRANTY:

- A. Product Warranty: Limited, non-pro-rated product warranty of vertical siding for 30 years.
- B. Finish Warranty: Limited product warranty against manufacturing finish defects.

1. When used for its intended purpose, properly installed and maintained according to manufacturer's published installation instructions, for a period of 15 years from the date of purchase: will not peel; will not crack; and will not chip. Finish warranty includes the coverage for labor and material.

C. Workmanship Warranty: Application limited warranty for 2 years.

## PART II PRODUCTS

### 2.01 MANUFACTURER:

A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work are

1. James Hardie Building Products Inc., 26300 La Alameda, Suite 250, Mission Viejo, California 92691, 888-542-7343, [www.jameshardie.com](http://www.jameshardie.com)
2. MAXITILE, Inc., 15055 Woodham Dr., Houston, TX 77073, 800-451-2003, 281-742-7072, Fax: 888-308-7441, [www.maxitile.com](http://www.maxitile.com)
3. CertainTeed Corporation, P.O. Box 860, Valley Forge, PA 19482, 800-233-8990, [www.certainteed.com](http://www.certainteed.com)

### 2.02 FIBER-CEMENT PANEL SIDING:

A. Non-asbestos fiber-cement siding to comply with ASTM Standard Specification C1186 Grade II, Type A.

B. Siding to meet the following building code compliance National Evaluation Report No. NER 405 (BOCA, ICBO, SBCCI); City of Los Angeles, Research Report No. 24862; Metro Dade County, Florida Acceptance No. 94-1234.04; US Department of Housing and Urban Development Materials Release 1263a; California DSA PS-019; and City of New York MEA 223-93-M. Non-asbestos fiber-cement siding to be non-combustible when tested in accordance with ASTM test method E136.

C. Type: As indicated on drawings.

### 2.03 FASTENERS:

A. Metal Framing: 15/8" No. 8 – 18 c 0.0323" head self-drilling, corrosion resistant S-12 Buglehead screws.

B. Fasteners: Non-corrosive aluminum siding nails in sufficient length to penetrate minimum of 1 inch into substrate. Provide prefinished fasteners in color to match siding where face nailing is unavoidable.

### 2.04 CORNER BOARDS AND TRIM ASSOCIATED WITH FIBER CEMENT SIDING:

A. Composite wood product: Exterior grade, treated wood composite trim material.

B. Basis of Specification: MiraTec® treated composite wood panels as manufactured by CMI 500 W. Monroe St. Suite 2010, Chicago IL 60661 Phone: 866-382-8701.

C. Boards:

1. Material: Wood fibers combined with phenolic resins, zinc borate, and water repellent. Essentially formaldehyde free.
2. Surface: Clear cedar texture one side, smooth the other. Primed 4 sides.
3. Substrate: 1-piece solid substrate, uniform density, not laminated. No knots or voids.

4. Thickness: 4/4
5. Typical Properties, 4/4 Thickness:
  - a. Density, ASTM D 1037: 49 pounds per cubic foot.
  - b. Modulus of Rupture, ASTM D 1037: 3,900 psi.
5. 24-Hour Soak, ASTM D 1037:
  - a. Water Absorption: 7.6 percent.
  - b. Thickness Swell: 1.9 percent.
6. Accelerated Aging Test, 6-Cycle, ASTM D 1037: Retained 90 percent of original strength.
7. Termite Resistance and Decay, AWWA E7 Rating Scale, 3-Year Exposure:
  - a. Termite Resistance Score: 8.8 out of 10.
  - b. Termite Decay Score: 10 out of 10.
8. Rot Resistance, AWWA E10:
  - a. White Rot: 3.66 percent weight loss.
  - b. Brown Rot: 1.02 percent weight loss.

### PART III EXECUTION

#### 3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Nominal 2 inch by 4 inch (51 mm by 102 mm) wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
  1. Install water-resistive barriers and claddings to dry surfaces.
  2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
  3. Protect siding from other trades.
- D. Minimum 20 gauge 3-5/8 inch (92 mm) C-Stud 16 inches maximum on center or 16 gauge 3-5/8 inches (92 mm) C-Stud 24 inches (610 mm) maximum on center metal framing complying with local building codes, including the use of water-resistive barriers and/or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
  1. Install water-resistive barriers and claddings to dry surfaces.
  2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
  3. Protect siding from other trades.

#### 3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best

result for the substrate under the project conditions.

- C. Install a water-resistive barrier is required in accordance with local building code requirements.
- D. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements.
- E. Install weather barrier in accordance with local building code requirements.
- F. Use Seam Tape for joints and laps.
- G. Install all necessary flashing for a water-tight installation.

### 3.03 INSTALLATION - VERTICAL SIDING

- A. Install materials in strict accordance with manufacturer's installation instructions.
- B. Block framing between studs where siding horizontal joints occur.
- C. Install metal Z flashing and provide a 1/4 inch (6 mm) gap at horizontal panel joints.
- D. Place fasteners no closer than 3/8 inch (9.5 mm) from panel edges and 2 inches (51 mm) from panel corners.
- E. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.
- F. Maintain clearance between siding and adjacent finished grade.
- G. Specific framing and fastener requirements refer to Tables 2 and 3 in National Evaluation Service Report No. NER-405.

### 3.04 INSTALLATION OF COMPOSITE WOOD TRIM:

- A. Cutting
  - 1. Use a fine toothed hand saw or power saw with a combination blade.
  - 2. Cut into exposed face of the material
- B. Fastening
  - 1. Double nail a maximum of 16. O.C. for all trim applications.
  - 2. Double nail a maximum of 24. O.C. for fascia.
  - 3. Do not nail into cut edge of material.
  - 4. Nails must penetrate a minimum of 1 ¼. into framing member.
  - 5. Fasten MiraTEC from one end to the other, do not nail towards the ends from center.
- C. Butt Joints
  - 1. All joints must fall over a framing member.
  - 2. Space all butt and scarf joints 1/8. and apply sealant into the full depth of the 1/8. joint.
  - 3. Double nail on both sides of joint, at least ½. from the edge.
- D. Fasteners
  - 1. Use nails with a 3/16. head diameter, long enough to penetrate 1 ¼. into structural framing member.
  - 2. Use nails with performance equivalent to hot dipped galvanized or better (such as 304 SS).

3. Screws, ring shank nails, etc. can be used as long as they meet the same minimum performance criteria as above.
4. Tapered or bugle head fasteners are permitted when heads are properly seal from moisture.
5. Do not countersink fasteners more than 1/8.. All slightly counter sunk fasteners less than 1/8. should be filled with exterior putty and painted.

E. Flashing and Moisture Control

1. Do not apply trim to wet sheathing.
2. Do not apply trim closer than 6. to finished grade or landscaping.
3. Do not allow the trim to stand in water.
4. Do not allow direct contact with masonry or concrete. Properly flash and space a minimum of 1/2. from any concrete flatwork or horizontal brick ledge.
5. At foundations or brick veneer, the product should be separated from the masonry by metal flashing, polyethylene film, 30 lb. felt or a 1/4. to 1/2. air space using masonry standoffs.

F. Sealant

1. Do not allow water to stand on or leak behind any trim.
2. Sealant is required at butt joints and where trim abuts siding, windows, doors, or other materials.
3. Do not use hard-setting caulk. Rather, use exterior quality sealants that remain flexible over time.
4. Caulks and sealants that at a minimum meet ASTM C920 are recommended.

G. Machining

1. Do not machine or route the trim in excess of 5/16. depth.
2. Maintain a minimum angle of 100 degrees from the vertical to provide positive drainage.
3. Reprime all machined areas.

3.05 FINISHING

- B. Finish factory primed siding with a minimum of one coat of high quality 100 percent acrylic or latex or oil based exterior grade paint within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions. If coverage is not complete and uniform, additional coats must be added until the finished surface is satisfactory and accepted by the Architect.

3.06 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.07 ADJUSTING:

- A. Replace damaged siding materials with new materials complying with specified requirements.

3.08 CLEANING:

- A. Clean finished surfaces as recommended by siding manufacturer, and maintain in a clean condition during construction.

End of Section

## SECTION 07 62 00 – FLASHING AND SHEET METAL

### PART I GENERAL

#### 1.01 SCOPE:

A. Provide all labor, equipment, and materials to fabricate and install the following.

1. Edge strip and flashing.
2. Fascia, and trim.
3. Thru wall flashings.
4. Expansion joint and area divider covers.
5. Auminum Coil Wrap.
6. Gutters and down spouts.

#### 1.02 RELATED DOCUMENTS:

A. General Requirements, apply to the work under this section.

Section	04 20 00	Unit Masonry
Section	06 10 00	Carpentry Section
Section	07 71 00	Gutters and Downspouts
Section	07 92 00	Sealants and Caulking

#### 1.03 REFERENCES:

A. American Society for Testing and Materials (ASTM)

1. A653-00 Standard Specification for Steel Sheet, Zinc-Coated (galvanized) or Zinc-Iron Alloy-Coated (galvannealed) by the Hot-Dip Process.
2. A792-99 Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip Process.
3. B209-00 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
4. B221-00 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

B. Warnock Hersey International, Inc., Middleton, WI (WH)

C. Factory Mutual Research Corporation (FMRC)

D. Underwriters Laboratories (UL)

E. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

1. 2012 Edition Architectural Sheet Metal Manual, 7<sup>th</sup> edition

F. National Roofing Contractors Association (NRCA)

1. Roofing and Waterproofing Manual, 5<sup>th</sup> Edition

G. ASCE 7-10 Minimum Design Loads for Buildings and Other Structures

#### 1.04 SUBMITTALS:

A. Submit under provisions of Section 01 33 00 - Submittals.

B. Product Data

- C. Provide manufacturer's specification data sheets for each product in accordance with Section 01 33 00 - Submittals.
- D. Metal material characteristics and installation recommendations.
- E. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those specified can be approved.
- F. Provide approval letters from metal manufacturer for use of their metal within this particular roofing system type.
- G. Submit two (2) samples, illustrating typical metal edge, coping, gutters, fascia extenders for material and finish.
- H. Provide 6" square sample of specified sheet materials for Architect approval.
- I. Shop Drawings
  - 1. For manufactured and shop fabricated gravel stops, fascia, scuppers, and all other sheet metal fabrications.
  - 2. Shop drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashing, termination's, and installation details.
  - 3. Indicate type, gauge and finish of metal.
- J. Certification
  - 1. Submit roof manufacturer's certification that metal fasteners furnished are acceptable to roof manufacturer.
  - 2. Submit roof manufacturer's certification that metal furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.05 QUALITY ASSURANCE:

- A. Engage an experienced roofing contractor specializing in sheet metal flashing work with a minimum of five (5) years experience.
- B. Successful contractor is required to maintain a full-time supervisor/foreman who is on the job-site at all times during installation of the new roof perimeter flashing. Foreman must have a minimum of five (5) years experience with the installation of similar system to that specified.
- C. Successful contractor must obtain all components of roof system from a single manufacturer including any roll good materials, if required. Any secondary products that are required, which cannot be supplied by the specified manufacturer, must be recommended and approved in writing by the primary manufacturer prior to bidding.
- D. If required, fabricator/installer shall submit work experience and evidence of adequate financial responsibility. The owners representative reserves the right to inspect fabrication facilities in determining qualifications.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.
- B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials which may cause discoloration or staining.

1.07 JOB CONDITIONS:

- A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage requirements for pre-formed metal edge system.

1.08 DESIGN AND PERFORMANCE CRITERIA:

- A. Thermal expansion and contraction:

1. Completed metal edge flashing system shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.

1.09 WARRANTIES:

- A. Owner shall receive one (1) warranty from manufacturer of roofing materials covering all of the following criteria. Multiple warranties are not acceptable.

1. Pre-finished metal material shall require a written 20-year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D-2244 or chalking excess of 8 units per ASTM D-659. If either occurs material shall be replaced per warranty, at no cost to the Owner.
2. Changes: Changes or alterations in the edge metal system without prior written consent from the manufacturer shall render the system unacceptable for warranty(ies).
3. Warranty shall commence on date of substantial completion or final payment, whichever is agreed by contract.
4. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of two years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work caused by such leaks or the repairs thereof.
5. Installing roofing contractor shall be responsible for the installation of the edge metal system in general accordance with the membrane manufacturer's recommendations.
6. Installing contractor shall certify that the edge metal system has been installed per the manufacturer's printed details and specifications.
7. One manufacturer shall provide a single warranty for all accessory metal for flashings, metal edges and copings, along with the warranty for metal roof areas, membrane roof areas, and any transitions between two different material types.

PART II PRODUCTS

2.01 MATERIALS:

- A. Sheet Steel: Prepainted, Metallic-Coated Steel Sheet: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Exposed base flashing metal material:

- a. Aluminum-zinc alloy (galvalume) coated steel, ASTM A792, coating designation AZ-50, in thickness of .0217 nom. /24 gauge or .0336 nom. 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.

2. Unexposed base flashing metal material:

- a. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0299 nom. / 22 gauge; 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.



3. Minimum gauge of steel or thickness of Aluminum to be specified in accordance with Architectural Sheet Metal Manual, Sheet Metal and Air Conditioning Contractor's National Association, Inc. recommendations.

4. Exposed surfaces for coated panels:

- a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer.

Weathering finish as referred by National Coil Coaters Association (NCCA).

<u>Property</u>	<u>Test Method</u>	<u>Fluorocarbon*</u>	
Pencil Hardness	ASTM D-3363	HB-H	
Bend	NCAA II-2		
Cross-Hatch Adhesion	ASTM D-4145	O-T	NCAA II-19
Gloss	ASTM D-3359		
Reverse Impact	no loss of adhesion		
Nominal Thickness	ASTM D-523	25+/-5%	(60° angle)
	ASTM D-2794	no cracking or loss of adhesion	
	ASTM D-1005		
primer	0.2 mils		
topcoat	0.8 mils		
TOTAL	1.0 mils		

\*Subject to minimum quantity requirements

- b. Color shall be as specified

- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, .032 inch thickness unless otherwise noted, finished as follows:

1. Mill Finish: One-side

2. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

- a. Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA [2604] [2605].

## 2.02 RELATED MATERIALS:

- A. Metal Primer: Zinc chromate type.
- B. Plastic Cement: ASTM D 4586
- C. Sealant: Non-hardening sealant shall be 1-part acrylic terpolymer sealant.
- D. Underlayment: ASTM D2178, No15 asphalt saturated roofing felt.
- E. Slip Sheet: Rosin sized building paper.

F. Fasteners:

1. Corrosion resistant screw fastener as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.
2. Fastening shall conform to Factory Mutual 1-45 requirements or as stated on section details, whichever is more stringent.

2.03 METAL COPING: Not Used

2.04 METAL GRAVEL STOP/ FASCIA AND GUTTER SYSTEM:

- A. Fascia on buildings shall be 24 gage prefinished steel fascia. Fascia system shall include fascia cover, gutter/splice plate, anchor plate, seal strips, anchors, and all accessories. System shall include Drain-thru gravel Stop in conjunction with gutters. Gutter brackets shall be formed from 3/16 inch by 1 inch G-90 galvanized steel. Gutter support brackets and spacers shall be provided at 3 feet on center maximum.
- B. A shop fabricated Gutter and fascia/gravel stop system, fabricated from .032 inch prefinished aluminum. Gutter and gravel stop system conforming to Figure 1-13 A SMACNA 5<sup>th</sup> edition may be used in lieu of the above referenced manufactured systems. Gutter brackets shall be formed from 3/16 inch by 1 inch prefinished G-90 galvanized steel. Gutter support brackets and spacers shall be provided at 3 feet on center maximum.
- C. Downspouts shall be a premanufactured downspout system fabricated from .032 inch Aluminum in accordance Figure 1-31 SMACNA 5<sup>th</sup> edition. Provide downspout hangers of .028 inch Aluminum, fabricated in accordance with accordance Figure 1-35H SMACNA 5<sup>th</sup> edition. Locate downspout hangers 6 feet apart maximum, no more than 2 feet from the top and bottom of the downspout. Provide a minimum of 2 hangers per downspout.
1. Basis of Design: Rectangular corrugated aluminum fabricated from 0.032 inch thick material as manufactured by Spectra Metal Sales, Inc., 6104 Boat Rock Blvd. SW, Atlanta, GA
    - a. Provide premanufactured type "A" and "B" elbows as required by project conditions.
- D. Finish on conductor heads, downspouts, and accessories shall be Kynar 500 . **Color shall be as selected by the Architect from the manufacturer's standard colors.**
- E. Joints, end caps, and expansion joints in gutters and downspouts shall be made be the "Rivseal" procedure. Apply Gutterseal to the joint and then draw joint tight by blind riveting.
- F. Provide expansion joints in gutters at 40 feet on center maximum.
- G. Where downspouts are subject to damage from groundskeeping equipment or vehicular traffic, provide downspout protection covers fabricated from 10 gage prefinished G-90 galvanized steel in accordance with SMACNA Figure 1-32I . Protection covers shall be set 1 foot above grade and shall extend to 3 feet above grade and shall be fastened to wall with 6 minimum ¼ inch diameter sleeve anchors.

2.05 THROUGH WALL METAL SCUPPER: Not Used

2.06 WATERPROOF UNDERLAYMENT UNDER COPINGS: Not Used

2.07 THROUGH WALL FLASHING:

- A. Fabric thru-wall flashing shall be Sandell Copper Fabric Flashing with 3 oz. per square foot copper sheet, manufactured by Sandell Manufacturing Company, Inc. Cambridge, Mass.; Wasco Copper

Fabric Flashing with 5 oz. per square foot copper sheet, manufactured by Wasco Products, Inc., Sanford, Maine, or approved substitute.

1. Flashing shall be embedded in the mortar joint of CMU backup walls or attached to metal stud walls with metal termination bar.
  2. Joints in Flashing shall be made by lapping a minimum of 4 inches and coating surfaces with Sandell Asphalt Trowel Mastic.
- B. Provide 1/8 inch thick by 1 inch type 304 stainless steel termination bar at attachment of through wall flashing to metal stud walls. Attach termination bar to framing at 16 inches on center with self tapping screws.
1. Acceptable products:
    - Type T1 as manufactured by Hohmann & Barnard Inc.
    - Termination bar as manufactured by Dur-O-Wal
    - Termination bar as manufactured by Heckmann Building Products
    - Termination bar as manufactured by Sandell Manufacturing
    - Termination bar as manufactured by Wire Bond
- C. Sealant for top of termination bar shall be a multicomponent non-sagging urethane sealant complying with ASTM C920 for type M, Grade NS, class 25, Uses A, G, M, and O as applicable to joint substrates. Provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated. Acceptable manufacturers include DAP, Pecora, Sonneborn, and Tremco.
1. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression for a total of 100 percent movement.

## 2.08 BASE AND COUNTER FLASHING

- A. Base and Counter Flashing associated with roof to wall intersections shall be fabricated in accordance with Figure 4-7A SMACNA 5<sup>th</sup> ed.
1. Separate pieces of base flashing are installed as each course of shingles is applied. The upper edge of each piece of flashing should extend 2 inches above each course of shingles. The lower edge should be 1/2 inch above the butts of the singles forming the next course. Flashing must extend up the wall and onto the roof a minimum of 4 inches. Flashing pieces are nailed to the roof sheathing above the top of each shingle course.
  2. Counter flashing is installed in a reglet left by the mason or cut by the Contractor. Wedges or tension formig shapes are used to hold the counter flashing in place and the reglet is filled with a compatible sealant. The length of each piece of counter flashing will vary with the slope of the roof but no step should be more than 8 inches high. The width will vary but should always be wide enough to cover 4 inches of the base flashing.

## PART III EXECUTION

### 3.01 COORDINATION:

- A. Coordinate the installation of sheet metal work with the work of other trades, e.g. thru-wall flashing and counterflashing with installation of masonry work.

### 3.02 PROTECTION:

- A. Dissimilar metals shall not be allowed to come in contact with each other. Isolate any dissimilar metals, masonry or concrete, from metals using bituminous paint, tape, or slip sheet. Use gasketed fasteners where required to prevent corrosive actions.

### 3.03 GENERAL:

- A. Fastening of metal to walls and wood blocking shall comply with SMACNA Architectural Sheet Metal Manual, Factory Mutual I-60 wind uplift specifications and/or manufacturer's recommendations whichever is of the highest standard.
- B. All accessories or other items essential to the completeness of sheet metal installation, whether specifically indicated or not, shall be provided and of the same material as item to which applied.
- C. Allow sufficient clearances for expansion and contraction of linear metal components. Secure metal using fasteners as required by the system. No exposed face fastening shall be accepted.

### 3.04 INSPECTION:

- A. Verify curbs are solidly set and nailing strips located.
- B. Beginning of installation means acceptance of existing conditions.
- C. Field measure site conditions prior to fabricating work.
- D. Edge metal installation shall not disrupt other trades. Verify that substrate is dry, clean and free of foreign matter.

### 3.05 MANUFACTURED SHEET METAL SYSTEMS:

- A. Installing Contractor shall be responsible for determining if the edge metal systems are in general conformance with roof manufacturer's recommendations.
- B. Furnish and install manufactured fascia systems in strict accordance with manufacturer's printed instructions.
- C. Provide all factory-fabricated accessories including, but not limited to, fascia extenders, miters, scuppers, joint covers, etc.

### 3.06 COPINGS: Not Used

### 3.07 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets spaced not more than 36 inches (900 mm) apart. Provide end closures and seal watertight with sealant. Slope to downspouts at a rate of 1/8 inch per foot.
  - 1. Fasten gutter spacers to front and back of gutter.
  - 2. Loosely lock straps to front gutter bead and anchor to roof deck.
  - 3. Anchor and loosely lock back edge of gutter to continuous eave or apron flashing.
  - 4. Install gutter with expansion joints at locations indicated, but not exceeding, 40 feet apart. Install expansion-joint caps.
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.

1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
  2. Provide elbows at base of downspout to direct water away from building.
  3. Connect downspouts to underground drainage system indicated.
- D. Splash Pans: Install where downspouts discharge on low-slope roofs. Set in asphalt roofing cement compatible with roofing membrane.

3.08 SOLDERING:

- A. Clean and roughen edges to be soldered. Apply non-corrosive flux precoat to the surfaces to be joined with solder alloy for a distance of 1-1/2" back from edge of metal. Remove flux residue with clean water. Assemble the parts and solder, using regular non-corrosive rosin flux.
- B. Soldering shall be used for sealing only and joints that must withstand mechanical stresses shall be riveted or screwed in addition to soldering.
- C. Solder shall be 50-50 tin lead type.

3.09 SHOP FABRICATED SHEET METAL:

- A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.
- B. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.
- C. Hem exposed edges.
- D. Angle bottom edges of exposed vertical surfaces to form drip.
- E. All corners for sheet metal shall be lapped with adjoining pieces fastened and set in sealant.
- F. Install sheet metal to comply with Architectural Sheet Metal manual, Sheet Metal and Air Conditioning Contractor's National Associations, Inc.

3.10 FLASHING MEMBRANE INSTALLATION: Not Used

3.11 FABRIC THRU-WALL FLASHING:

- A. Install thru-wall flashing continuous near base of all exterior walls, just below drip openings in face brick wythe, and elsewhere as shown on the drawings. Flashing shall be laid in a slurry of fresh mortar and topped with a fresh full bed of mortar. Flashing shall start flush with outside face of wall, cross the cavity on mortar bed and extend up on the face of the inner wythe a minimum of 6" and be turned back into concrete block mortar joint or attached to the wall with termination bar and sealant.

B. **Head and Sill Flashing:**

The flashing shall start flush with the outside of the wall or lintel angle, then carried through or up the wall as indicated. Flashing shall extend 6" beyond each side of the opening and be turned up at the sides forming a pan. All corners shall be folded, not cut.

C. **Other Areas:**

All membrane flashing at other locations shall be installed in accordance with manufacturer's recommendations.

D. **Joining of Material:**

Joint shall be made by lapping a minimum of 4" and coating the contacting surfaces with Mastic recommended by the manufacturer.

End of Section

## SECTION 07 71 00 – GUTTERS AND DOWNSPOUTS

### PART I GENERAL

#### 1.01 DESCRIPTION

- A. This section includes requirements pertaining to sheet metal work for gutters and downspouts. Dimensions, details of fabrication and area of usage shall be as shown on the drawings.

#### 1.02 SUBMITTALS

- A. Prepare and submit shop drawings for all proposed work of this section.
- B. Product data: Indicate product description, finishes and installation instructions including interface with adjacent materials and surfaces.
- C. Samples: Submit manufactured expansion joint covers.

#### 1.03 MANUFACTURERS

- A. In order to define requirements for quality, function, sizes, gauges, grades, colors, etc. for manufactured products, the specifications for materials designate brand names of products that conform to minimum requirements that are acceptable.

#### 1.04 COORDINATION WITH OTHER TRADES

- A. When work is to be executed in conjunction with roofing and flashing products that are to be bonded by the roofing product manufacturer, the sheet metal work shall be coordinated and executed to permit required bonds to be obtained.

#### 1.05 REFERENCE STANDARDS

- A. Industry standards
  - 1. Kaiser Aluminum Company, "Technical Information Architectural Aluminum
  - 2. Aluminum Association, "Aluminum Sheet Metal Work in Building Construction"
- B. ASTM Standards
  - 1. Aluminum alloy sheet and plate: ASTM B209- 73
  - 2. Solder metal: ASTM B32- 70

#### 1.06 WARRANTY

- A. Warrant flashing and sheet metal work to be free of defects in materials and workmanship. Warranty period shall be one (1) year.

### PART II PRODUCTS

#### 2.01 SHEET METAL MATERIALS

- A. Aluminum Sheet: ASTM B 209 (ASTM B 209M), Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, .032 inch thickness unless otherwise noted, finished as follows:
  - 1. Mill Finish: One-side

2. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    - a. Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2604 2605.
  3. Color to be selected by the Architect from the manufacturer's full product line.
- B. Gutters shall be fabricated from 0.027 inch thick material and furnished with all necessary prefabricated components and accessories.
- C. Downspouts shall be fabricated from 0.019 inch thick material and furnished to match gutters. Furnish all brackets, bends and accessories as required.
- D. Solder materials
1. Shall conform to ASTM B32, composition shall contain 50% tin and 50% lead except as specified otherwise.
  2. Solder for aluminum and metal shall be of composition as recommended by metal manufacturer.
  3. Solder flux: Muriatic acid neutralized with zinc for galvanized metal
- E. Mastic: Meet ASTM D2822-82, fibrated asphalt flashing cement.
- F. Fasteners: Same material or compatible with sheet metal being fastened
1. Nails: Flathead, needle point, not less than 12 gauge and of length to penetrate substrate 1" minimum
  2. Expansion shields: Lead or bronze sleeves
  3. Screws: Self-tapping type, with round heads
  4. Bolts: Furnished complete with nuts and washers
  5. Rivets: Round head type
  6. Blind clips and cleats shall be the same gauge as sheet metal.
- G. Caulk: Pecor, Corp.: BR-96, non-shrink, non-drying butyl caulk

## 2.02 DISSIMILAR MATERIALS

- A. Where sheet metal abuts or members into adjacent dissimilar materials, execute juncture to prevent electrolysis between the two materials.

## 2.03 ACCESSORIES

- A. Provide all accessories essential to complete sheet metal installation of same kind of material as item to which applied. Nails, screws and bolts shall be of types and of a composition that is compatible with metal.

## 2.04 SHEET METAL FABRICATION:

- A. Fabricate gutter system to conform to Figure 1-19 A SMACNA 5<sup>th</sup> edition. Gutter shall be ogee shaped similar to Style K shown in Figure 1-2 SMACNA 5<sup>th</sup> ed.



- B. Gutter brackets shall be formed from 3/16 inch by 1 inch G-90 galvanized steel. Gutter support brackets and spacers shall be provided at 3 feet on center maximum.
- C. Downspouts shall be fabricated in accordance Figure 1-32B SMACNA 5<sup>th</sup> edition. Provide downspout hangers fabricated in accordance with accordance Figure 1-35H SMACNA 5<sup>th</sup> edition. Locate downspout hangers 6 feet apart maximum, no more than 2 feet from the top and bottom of the downspout. Provide a minimum of 2 hangers per downspout.
- D. Joints, end caps, and expansion joints in gutters and downspouts shall be made be the "Rivseal" procedure. Apply Gutterseal to the joint and then draw joint tight by blind riveting.
- E. Provide expansion joints in gutters at 40 feet on center maximum.
- F. Where downspouts are subject to damage from groundskeeping equipment or vehicular traffic, provide downspout protection covers fabricated from .040 inch prefinished aluminum in accordance with SMACNA Figure 1-32I . Protection covers shall be set 1 foot above grade and shall extend to 3 feet above grade and shall be fastened to wall with 6 minimum ¼ inch diameter sleeve anchors.
- G. Provide and install 16 inch by 30 inch precast reinforced concrete splash blocks as at all downspouts that empty on grade.

### PART III EXECUTION

#### 3.01 WORKMANSHIP

- A. Except as otherwise shown or specified, workmanship of sheet metal, including method of forming joints, anchoring, cleating and provisions for expansion, shall conform to details and recommendations of the "Architectural Sheet Metal Manual" published by the Sheet Metal and Air Conditioning Contractors National Association.

#### 3.02 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes workmanship. Warranty period shall be one (1) year.

End of Section

## SECTION 07 84 13 – FIRE STOPPING

### 1 PART I GENERAL

#### 1.01 SUMMARY:

##### A. Section Includes:

1. Penetrations through fire-resistance-rated floor, wall and roof construction including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
2. Construction-gap firestopping at connections of the same or different materials in fire-rated construction.
3. Construction-gap firestopping occurring within fire-rated wall, floor or floor-ceiling assemblies.
4. Construction-gap firestopping occurring at the top of fire-rated walls.
5. Through-penetration smoke-stopping in smoke partitions.
6. Construction-gap smoke-stopping in smoke partitions.

##### B. Related Items:

1. Division 3 Section “Cast-In-Place Concrete” for construction of openings in concrete slabs.
2. Division 4 Section “Unit Masonry” for joint fillers for fire-resistive-rated masonry construction.
3. Division 7 Section “Joint Sealants” for non fire-resistive-rated joint sealants.
4. Division 22 Sections specifying piping penetrations.
5. Division 23 Sections specifying ducts penetrations.
6. Division 16 Sections specifying cable and conduit penetrations.

#### 1.02 SYSTEM PERFORMANCE REQUIREMENTS:

A. General: Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.

##### B. Underwriters Laboratories

1. U. L. Fire Resistance Directory
  - a. Through-Penetration firestop devices (XHCR)
  - b. Fire resistance ratings (BXUV)
  - c. Through-penetration firestop systems (XHEZ)
  - d. Fill, void, or cavity material (XHHW)
2. U. L. 1479 Test Method for fire Tests of Through-Penetration Firestops, including optional air leak test.

- 3. U. L. Component Listing Test Criteria
- 4. Warnock Hersey
- C. American Society For Testing And Materials Standards:
  - 1. ASTM.E 814-88: Standard Test Method For Fire Tests of Through-Penetration Firestops.
  - 2. ASTM 1399
- D. CIE/DIN Age Testing

#### 1.03 DEFINITIONS:

- A. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.
- B. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.
- C. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire, gases and smoke.
- D. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.
- E. Construction Gaps: Gaps between adjacent sections of walls, exterior walls, at wall tops between top of wall and ceiling, and structural floors or roof decks; and gaps between adjacent sections of structural floors.
- F. System: Specific products and applications, classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.
- G. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.
- H. F-Rated: Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.
- I. T-Rated: Through-Penetration Firestop Systems: Provide through-penetration firestop systems with T ratings, in addition to F ratings, as determined per ASTM E 814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas.

#### 1.04 SYSTEM DESCRIPTION:

- A. Design Requirements
  - 1. Fire-rated construction: Maintain barrier and structural floor fire resistance ratings (F rating) including resistance to cold smoke at all penetrations, connections with other surfaces or types of construction, at separations required to permit building movement and sound or vibration absorption, and at other construction gaps.

#### 1.05 SUBMITTALS:

- A. Submit in accordance with Section 01300, unless otherwise indicated.

- B. Product data: Manufacturer's specifications and technical data including the following:
  - 1. Detailed specifications of construction and fabrication.
  - 2. Manufacturer's installation instructions.
- C. Shop drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.
  - 1. Details of each proposed assembly identifying intended products and applicable UL System number, or UL classified devices.
  - 2. Manufacturer or manufacturer's representative shall provide qualified engineering judgements and drawings relating to non-standard applications as needed.
- D. Quality control submittals:
  - 1. Statement of qualifications.
- E. Applicators' qualifications statement:
  - 1. List past projects indicating required experience.
  - 2. Provide information to support 1.06 A, 1-3.

1.06 QUALITY ASSURANCE:

- A. Installer's Qualifications: Firm specializing in installation or application of systems similar in complexity to those required for this project, plus the following:
  - 1. Acceptable to or licensed by manufacturer, State or local authority where applicable.
  - 2. At least 5 years experience with systems.
  - 3. Successfully completed at least 5 comparable scale projects using this system.
- B. Single-Source Responsibility: Obtain through-penetration firestop systems for each kind of penetration, construction and any other firestop condition indicated from a single manufacturer.
- C. Coordinating Work: Coordinate construction of openings and penetrating items to ensure that designated through-penetration firestop systems are installed per specified requirements.
- D. Pre-Installation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings".

1.07 DELIVERY, STORAGE, AND HANDLING:

- A. Packing and Shipping:
  - 1. Deliver products in original, unopened packaging with legible manufacturer's identification.
  - 2. Coordinate delivery with scheduled installation date, allow minimum storage at site.
- B. Storage and Protection: Store materials in a clean, dry, ventilated location. Protect from soiling, abuse, moisture and freezing when required. Follow manufacturer's instructions.

1.08 PROJECT CONDITIONS:

- A. Existing Conditions:
  - 1. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
  - 2. Proceed with installation only after penetrations of the substrate and supporting brackets have been installed.
- B. Environmental Requirements:
  - 1. Furnish adequate ventilation if using solvent.
  - 2. Furnish forced air ventilation during installation if required by manufacturer.
  - 3. Keep flammable materials away from sparks or flames.
  - 4. Provide masking and drop clothes to prevent contamination of adjacent surfaces by firestopping materials.
  - 5. Comply with manufacturing recommendations for temperature and humidity conditions before, during and after installation of firestopping.

1.09 GUARANTEE:

- A. Submit copies of written guarantee agreeing to repair or replace joint sealers which fail in joint adhesion, extrusion resistance, migration resistance, or general durability or appear deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated. The guarantee period shall be one year from date of substantial completion.

2 PART II PRODUCTS

2.01 MANUFACTURERS:

- A. 3M Fire Protection Products, 3M Center 207-1-02, St Paul, MN 55144-1000, (800) 328-1687. (Contact: Bart Russell, Exterior Materials, Inc., Knoxville, TN. Phone: 865-558-6380).
- B. International Protective Coatings Corporation/AkzoNobel, 3416 North Bend Circle, Northpark Building #5, Alcoa, TN. 37701, Phone: (865) 983-3003.
- C. The Rectorseal Corporation, 2601 Spenwick Drive, Houston, TX 77055, Phone: (800)231-3345.
- D. Tremco Inc. (The Euclid Chemical Co.) 3735 Green Road, Beechwood Ohio, 44122, Phone: (800)321-7906.

2.02 MATERIALS:

- A. Fill Materials For Through-Penetration Firestop Systems:
  - 1. Endothermic, Latex Compound Sealant: Single-component, endothermic, latex formulation.  
  
3M Products: Fire Dam 150, Fire Dam 150+  
Tremco, Inc.: Fyre-Shield
  - 2. Intumescent, Latex Sealant: Single-component, intumescent, latex formulation.  
  
3M Products: CP25 WB+  
Tremco, Inc.: Tremstop W.S. (Wrap Strip)

3. Intumescent Putty: Nonhardening, dielectric, water-resistant putty containing no solvents, inorganic fibers, or silicone compounds.  
  
3M Products: Moldable Putty Stix, Moldable Putty Pads
4. Intumescent Wrap Strips: Single component  
  
3M Products: FS-195+, Ultra GS 40  
Tremco, Inc.: Tremstop W.S. (Wrap Strip)
5. Mortar: Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogenous mortar.  
  
3M Products: Fire Barrier Mortar  
Tremco, Inc.: Tremco, Inc.: Tremstop M
6. Intumescent Composite Sheet: One part composite system of organic/inorganic, fire-resistive elastomeric sheet, 28 gauge steel, steel wire mesh and aluminum foil.  
  
3M Products: CS 195+
7. Silicone Sealant: Moisture-curing, single-component, silicone based, neutral-curing elastomeric sealant.  
  
3M Products: FB 2000, FB 2000+, FB 1000 N/S, FB 1000 S/L  
Tremco Inc.: Fyre-Sill, Fyre-Sil S. L.
8. Elastomeric Spray: One part, flexible, sprayable, water-based coating.  
  
3M Products: Fire Dam Spray  
Tremco, Inc.: Tremstop Acrylic Spray.

B. Through-Penetration Firestopping of Fire-Rated Construction:

1. Systems or devices listed in the U. L. Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it confirms to the construction type, penetrant type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos free. Mortar systems must be Warnock Hersey Approved.
2. Additional requirements: Withstand the passage of cold smoke either as an inherent property of the system, or by the use of separate product included as a part of the U. L. system or device, and designed to perform this function.
3. Acceptable Manufacturers and Products.
  - a. Those listed in the U. L. Fire Resistance Directory for the U. L. System involved or mortar systems approved by Warnock Hersey.
  - b. Applicable 3M products from 2.02A:
    - Endothermic Sealant
    - Intumescent sealant
    - Intumescent Putty
    - Intumescent Wrap Strips
    - Mortar

Intumescent Composite Sheets  
Silicone Sealant

C. Construction-Gap Firestopping Of Fire-Rated Construction

1. Firestopping at construction gaps between edges of floor slabs and exterior wall construction.
2. Firestopping at construction gaps between tops of partitions and underside of structural systems.
3. Firestopping at construction gaps between tops of partitions and underside of ceiling or ceiling assembly.
4. Firestopping of control joints in fire-rated masonry partitions.
5. Firestopping expansion joints.
6. Acceptable manufacturers and products- those listed in the U. L. Fire Resistance Directory. Applicable 3M products from Section 2.02A include Endothermic Sealant, Silicone Sealant, Elastomeric Spray and Intumescent Sealant

2.03 ACCESSORIES:

A. Provide components for each firestopping system that are needed to install fill materials and to comply with "System Performance Requirements" article in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Accessories include but are not limited to the following items:

1. Permanent forming/damming/backing materials including the following:
  - Semirefractory fiber (mineral wool) insulation.
  - Ceramic fiber.
  - Fire-rated formboard.
  - Backer Rod.
2. Steel Collars.
3. Steel Sleeves.
4. Temporary forming materials.

3 PART III EXECUTION:

3.01 EXAMINATION:

A. Verification of conditions: examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Verify barrier penetrations are properly sized and in suitable condition for application of materials.
2. Do not proceed until unsatisfactory conditions have been corrected

3.02 PREPARATION:

- A. Clean surfaces to be in contact with penetration seal materials of dirt, grease, oil, loose materials, rust, or the required fire resistance.

### 3.03 INSTALLATION:

- A. Install penetration seal materials in accordance with printed instructions of the U.L. Fire Resistance Directory or Mortars per Warnock Hersey approval and in accordance with manufacturer's instruction.
- B. Seal holes or voids made by penetrations to ensure an effective smoke barrier.
- C. Where floor openings without penetrating items are more than four inches in width and subject to traffic or loading, install firestopping materials capable of supporting same loading as floor.
- D. Protect materials from damage on surfaces subject to traffic.
- E. Where large openings are created in walls or floors to permit installation of pipes, ducts, cable trays, bus duct or other items, close unused portions of opening with firestopping material tested for the application. See U. L. Fire Resistance Directory or Warnock Hersey approvals.
- F. Install smoke stopping as specified for firestopping.
- G. Where rated walls are constructed with horizontally continuous air space, double width masonry, or double stud frame construction, provide vertical, 12 inch wide fiber dams for full thickness and height of air cavity at maximum 15 foot intervals.

### 3.04 FIELD QUALITY CONTROL:

- A. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.
- C. Perform under this section patching and repairing of firestopping caused by cutting or penetration by other trades.

### 3.05 ADJUSTING AND CLEANING:

- A. Clean up spills of liquid components.
- B. Neatly cut and trim materials as required.
- C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

End of Section



## SECTION 07 92 00 – SEALANTS AND CAULKING

### PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials, tools, equipment and services required to install joint sealants for the following locations:
  - 1. Joints in exterior vertical surfaces and non-traffic horizontal surfaces as indicated below:
    - a. Perimeter joints between wall materials and frames of doors and windows.
    - b. Joints between different materials.
    - c. Other joints as indicated on the drawings.
    - d. Openings around pipes projecting through exterior walls.
  - 2. Joints in exterior horizontal traffic bearing surfaces as indicated below:
    - a. Control and expansion joints in concrete paving.
  - 3. Interior joints in vertical and vertical surfaces as indicated below:
    - a. Joints between different materials.
    - b. Joints between plumbing fixtures and adjacent materials.
    - c. Joints around pipes projecting through interior walls.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.
- B Caulking in connection with ductwork is specified in Division 23.

#### 1.03 SUBMITTALS:

- A Submit manufacturer's product and application data on products specified.
- B Submit color charts on products requiring color selection.
- C Product test reports.

#### 1.04 QUALITY ASSURANCE:

- A Engage an experienced installer who has completed joint sealant applications similar in material, design, and extent to that indicated for the project that have resulted in construction with a record of successful in-service performance.

#### 1.05 ENVIRONMENTAL CONDITIONS:

- A Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than allowed by joint sealant manufacturer for application indicated.
  - 4. Until contaminant capable of interfering with their adhesion are removed from joint substrates.

## PART II PRODUCTS

### 2.01 GENERAL:

- A Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under the conditions of service and application as demonstrated by the manufacturer based on testing and field experience.
- B Match colors indicated by reference.

### 2.02 MATERIALS:

- A Sealant for caulking of control joints in concrete slabs shall be a two-part, Jet-Fuel-Resistant, non-sag, Polyurethane Rubber Sealant for Concrete: Pourable, chemically curing elastomeric formulation complying with the following requirements relative to formulation and with ASTM C 920 for Type, Grade, Class, and Uses indicated.
  - 1. Urethane formulation: Type M, Class 25, Uses T, M, and O as applicable to joint substrates.
  - 2. Grade P for joints in horizontal paved surfaces.
  - 3. Grade NS for vertical and other joints where installation of a Grade P (self-leveling) sealant would result in sealant flowing out of joint.
- B Sealant for all exterior caulking except as noted, and at cabinets shall be a multicomponent non-sagging urethane sealant complying with ASTM C920 for type M, Grade NS, class 25, Uses A, G, M, and O as applicable to joint substrates. Provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated. Acceptable manufacturers include DAP, Pecora, Sonneborn, and Tremco.
  - 1. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression for a total of 100 percent movement.
- C Sealant for exterior caulking in conjunction with exterior insulation and finish system shall be a single component non-sagging, neutral-curing, ultra low-modulus silicone building sealant complying with ASTM C-920 for type 5, Grade NS, class 25, Uses: A, M, and O as applicable to joint substrates. Provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated. Acceptable manufacturers include Dow Corning, Pecora and Tremco.
  - 1. Additional movement capability: 100 percent in extension and 50 percent in compression for a total of 150 percent movement.
- D Sealant for interior use unless otherwise specified shall be a paintable type DAP Acrylic Latex Caulk, Pecora AC-20 Acrylic Latex, or Tremco Acrylic Latex Caulk.
- E Sealant for interior use in conjunction with plumbing fixtures shall be a low-modulus nonacid-curing silicone sealant, type S, Grade NS, Class 25, uses: A, G, and O as applicable to joint substrates. Provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated. Acceptable manufacturers include DAP, Pecora, Sonneborn, and Tremco.

1. Additional Movement Capability: 100 percent movement in extension and 50 percent in compression for a total of 150 percent movement.
- F Primer shall be the type recommended by the sealant manufacturer and shall be supplied by the manufacturer of the sealant used.
- G Backup material and joint fillers shall be non-staining, compatible with sealant and primer used, and of a resilient nature. Raveled strands of non-staining rope fiber or cotton wicking may be used as filler in deep joints but the filler backing up the sealant shall be rod shaped foam neoprene, foam polyethylene, or hollow vinyl extrusions. Filler material impregnated with oil, bitumen, or similar substances shall not be used in any case.
- H Bond breakers shall be polyethylene tape, pressure sensitive masking tape as recommended by the sealant manufacturer.
- I Preformed Foam Sealants: Manufacturer's standard preformed, precompressed, impregnated open cell foam sealant manufactured from high density urethane foam impregnated with a nondrying water repellent agent: factory produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop watertight and airtight seal when compressed to the degree specified by the manufacturer, and complying with the following requirements:
1. Permanently mildew-resistant non-migratory, non-staining, and compatible with joint substrates and other joint sealants.
  2. Impregnating Agent: Chemically stabilized acrylic.
  3. Density: Manufacturer's standard.
  4. Backing: None
  5. Product shall be Colorseal as manufactured by Emseal Joint Systems Ltd., Westborough, MA. or product of Wil-Seal Construction Foams, Dir., Ill. Bruck meeting or exceeding the specified requirements.

## 2.03 JOINT SEALANT BACKING:

- A General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B Plastic Foam Joint Fillers: Preformed, compressible, resilient, non-staining, non-waxing, non-extruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance
- C Closed-cell polyethylene foam, non-absorbent to liquid water and gas, non-outgassing in unruptured state.
- D Elastomeric Tubing Joint Fillers: Neoprene, butyl EPDM, or silicone tubing complying with ASTM D 1056, non-absorbent to water and gas, capable of remaining resilient at temperatures down to -26° F (-32° C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- E Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

## PART III EXECUTION

### 3.01 EXAMINATION:

- A Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

### 3.02 PREPARATION:

- A Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  3. Remove laitance and form release agents from concrete.
  4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.03 INSTALLATION OF JOINT SEALANTS:

- A General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C Install joint filler of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
1. Do not leave gaps between ends of joint fillers.
  2. Do not stretch, twist, puncture, or tear joint fillers.
  3. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
- D Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the time sealant backings are installed.

- E Tooling of Non-sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
- F Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and to comply with sealant manufacturer's directions for installation methods, materials, and tools that produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in conformation with sealant manufacturer's recommendations.
- 3.04 CLEANING:
- A Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.
- 3.05 PROTECTION:
- A Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

End of Section

## SECTION 08 11 16 – METAL SWINGING PATIO DOORS:

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish and install metal swinging patio doors. See drawings for locations and quantities required.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 07 92 00 Sealants and Caulking

Section 08 71 80 Finish Hardware

Section 09 91 00 Painting

#### 1.03 SUBMITTALS:

- A Submit shop drawings in accordance with Section 013300.

### PART II PRODUCTS

#### 2.01 METAL SWINGING PATIO DOORS:

- A Exterior patio doors shall be steel clad 15 lite, polyurethane core, with insulating glass, wood frame threshold, and weatherstrip.
- B Doors and glazing shall have labeling indicating impact testing with "Miami-Dade County Product Control Approved" labels
- C Door shall be manufactured by Henley Supply Millwork Company, 112 North Front Street, Decherd, TN. 37324, Phone: (800) 251-8505. R. G. Darby Co. or Royal Door Corporation.
- D Alternate manufactures:
1. R.G. Darby, Darby Doors, LLC, 3110 Kendall Drive, Florence, AL. 35630, Phone: (800) 573-3667.
  2. Royal Door Corporation, 4822 Southerland Road, Houston, TX 77092, Phone: (713) 353-5800.
- E Doors shall be complete with weatherstripping and shall be fully prepared for hardware.
- F Finish: Baked-on enamel of color selected by the Architect.
- G For units indicated on drawings to be ADA-compliant or accessible, provide door thresholds which comply with ADA standards to allow unrestricted passage.

### PART III EXECUTION:

3.01 INSTALLATION:

- A Install doors in strict accordance with all pertinent codes and regulations, the approved submittals, the Contract Documents and the manufacturer's current recommendations, anchoring all components firmly in position for long life under hard use.
- B Prior to installation, all frames shall be checked and corrected for rack, twist and out-of-square.
- C Leave all material clean and free of all foreign matter. Touch up any damage to the finish surface.
- D Install finish hardware in strict accordance with the manufacturer's recommendations, eliminating all hinge-bound conditions and making all items smoothly operating and firmly anchored into position.

End of Section

## SECTION 08 11 50 – EXTERIOR DOORS:

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish and install all exterior insulated metal doors and frames, and all necessary incidental work in connection therewith.

#### 1.02 RELATED DOCUMENTS AND WORK SPECIFIED ELSEWHERE:

##### A General:

Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

##### B Related Sections:

Section 07 92 00 Sealants and Caulking

Section 08 71 80 Finish Hardware

Section 09 91 00 Painting

#### 1.03 SUBMITTALS:

- A Submit schedules and shop drawings of hollow metal doors and frames to the Architect for approval before any work is fabricated.

#### 1.04 DELIVERY, STORAGE, AND HANDLING:

- A Deliver products in cartons or crates for protection during transit and job storage.
- B Upon delivery, inspect metal doors and frames for damage. Repair minor damages provided repaired products are equal in all respects to new, and are acceptable to Owner's representative; otherwise, remove and replace damaged items.
- C Store doors and frames under cover. Store doors upright on wood runners or skids and covered with vented tarpaulins or vented plastic.

#### 1.05 GUARANTEE:

- A All insulated metal doors and frames shall be guaranteed for a period of one year from date of final acceptance against defects in materials and workmanship.

### PART II PRODUCTS

#### 2.01 INSULATED METAL DOORS:

- A Provide 6-panel insulated steel doors, compression weatherstrip, adjustable sill, fixed sweep, 1-1/2 pair 4x4 butts US3. At apartment entry doors provide 1 set of 4x4 butts and 2 sets of spring loaded hinges US3. Apartment entry doors, from breezeway, shall be B label assemblies. Entry door thresholds at apartments indicated as type A (handicap). Type B (accessible) shall have maximum 1/2" rise.

- 1. Knock-down frames are acceptable.



2.02 OTHER MATERIALS:

- A All other materials, not specifically described but required for complete and proper installation of exterior doors and frames shall be new, first quality, and compatible with the materials to which they are joined.

PART III EXECUTION

3.01 GENERAL:

- A Prior to starting installation, the Contractor shall check the work for any defects that might, in any way, affect the proper performance of this work.
- B Install standard steel doors, frames, and accessories in accord with manufacturer's latest printed instructions, and as herein specified.

3.02 FRAMES:

- A Set frames in position, accurately plumbed and aligned, and securely braced until permanently anchored. Remove temporary braces and spreaders after erection of walls.

3.03 ADJUSTMENT AND CLEANING:

- A Sand damaged or rusted areas of doors and frames and touch-up with a compatible air-drying primer. Clean doors and frames of substances injurious to paint finish.
- B Adjust, as necessary, operating hardware. Steel doors and frames to be undamaged and in proper operating condition.

End of Section



## SECTION 08 14 20 – WOOD DOORS

### PART I GENERAL

#### 1.01 SCOPE:

- A Provide all labor, materials, equipment, and supervision necessary to furnish and install wood doors as shown on the drawings and specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 08 71 80 Finish Hardware

Section 09 91 00 Painting

#### 1.03 SUBMITTALS:

- A Submit shop drawings for each type of door specified.

#### 1.04 QUALITY ASSURANCE:

- A. Source Limitations: Obtain wood doors through one source from a single manufacturer.
- B. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.
  - 1. Non-fire-rated doors shall comply with AWI requirements for PC-5 construction. P.C.7 doors will not be accepted.
- C. Comply with CS 171 and NFPA 80

#### 1.05 GUARANTEE:

- A A written guarantee from the door manufacturer shall be delivered to the Architect upon completion of the work. The doors shall be guaranteed for the life of the original installation in accordance with N.W.M.A. Standard Door Guarantee. Warranty shall include finishing and hanging.

#### 1.06 DELIVER AND HANDLING AND STORAGE:

- A Deliver, handle and store wood doors in a manner to prevent damage and deterioration.

### PART II PRODUCTS

#### 2.05 INTERIOR HOLLOW WOOD CORE DOORS:

- A Doors shall be pre-assembled units with paint grade molded hardboard veneers and hollow cores. Door units shall be pre-hung with 1-1/2 pair 3-1/2" x 3-1/2" butts, finger jointed jamb. Undercut the door 3/4" where required for return air or to clear the floor finish. Doors shall be manufactured in accordance with Basic Hardboard Standard PS-58-73,

and NWMA I.S. 1.1-80, sec. 3/7/3(b), and shall be faced with molded hardboard doorskins as manufactured by Masonite Corporation. Door style to be Craftmaster Colonist series with textured finish; primed and ready to receive paint.

2.06 INTERIOR SOLID CORE DOORS:

2.07 INTERIOR SOLID CORE DOORS:

- A Doors shall be molded hardboard veneers with solid core construction. Doors shall be pre-hung with 1-1/2 pair 3-1/2" x 3-1/2" butts, finger jointed jamb. Undercut the door 3/4" where required for return air or to clear the floor finish. Doors shall be manufactured in accordance with Basic Hardboard Standard PS-58-73, and NWMA I.S. 1.1-80, sec. 3/7/3(b). Door to be textured finish; primed and ready to receive paint, CraftCore as manufactured by Masonite Corporation, 506 Municipal Drive, Jefferson City, TN 37760, Phone: (800) 663-3667.

PART III EXECUTION

3.05 INSTALLATION:

- A The doors shall be fitted accurately in frames, leaving a maximum of 1/8" clearance around the head of jambs. Properly cut for sill clearance, mortise and cut out for hardware. Adjust as necessary to operate smoothly and properly.

End of Section

## SECTION 08 15 80 - VINYL WINDOWS

### PART 1 - GENERAL:

#### 1.01 SCOPE:

- A. Provide all materials, equipment labor and supervision to provide and install single hung vinyl replacement windows as shown on the drawings and as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 PERFORMANCE REQUIREMENTS:

- A. General: Provide vinyl windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified, and that are of test size indicated below:
  - 1. Size required by AAMA/WDMA 101/I.S.2/NAFS for gateway performance for both gateway performance and optional performance grade.
- B. Structural Performance: Provide vinyl windows capable of withstanding the effects of the following loads, based on testing units representative of those indicated for Project that pass AAMA/WDMA 101/I.S.2/NAFS, Uniform Load Structural Test:
  - 1. Design Wind Loads: Determine design wind loads applicable to Project from basic wind speed indicated in 137 miles per hour at 37 feet above grade, according to ASCE 7, "Chapter 26" based on mean roof heights above grade indicated on Drawings.
    - a. Basic Wind Speed: **137 mph.**
    - b. Importance Factor: **I.**
    - c. Exposure Category: **C.**

#### 1.04 SUBMITTALS:

- A. Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of vinyl window indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances, installation details, and the following:
  - 1. Mullion details, including reinforcement and stiffeners.
  - 2. Joinery details.
  - 3. Flashing and drainage details.
- C. Product Schedule: For vinyl windows. Use same designations indicated on Drawings.
- D. Qualification Data: For Installer and Manufacturer.

- E. Product Test Reports: Based on evaluation of comprehensive tests performed **within the last four years** by a qualified testing agency for each type, class, grade, and size of vinyl window. Test results based on use of downsized test units will not be accepted.
- F. Maintenance Data: For operable window sash operating hardware and finishes to include in maintenance manuals.
- G. Warranty: Special warranty specified in this Section.

1.05 QUALITY ASSURANCE:

- A. Installer Qualifications: An installer acceptable to vinyl window manufacturer for installation of units required for this Project.
- B. Manufacturer Qualifications: A manufacturer capable of fabricating vinyl windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion in lists and by labels, test reports, and calculations.
- C. Source Limitations: Obtain vinyl windows through one source from a single manufacturer.
- D. Product Options: Information on Drawings and in Specifications establishes requirements for vinyl windows' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
  - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Fenestration Standard: Comply with AAMA/WDMA 101/I.S.2/NAFS, "North American Fenestration Standard Voluntary Performance Specification for Windows, Skylights and Glass Doors," for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
- F. Glazing Publications: Comply with published recommendations of glass manufacturers and with GANA's "Glazing Manual" unless more stringent requirements are indicated.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to vinyl windows including, but not limited to, the following:
  - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review, discuss, and coordinate the interrelationship of vinyl windows with other exterior wall components. Include provisions for structural anchorage, glazing, flashing, weeping, sealants, and protection of finishes.
  - 3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
  - 4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.06 PROJECT CONDITIONS:

- A. Field Measurements: Verify vinyl window openings by field measurements before fabrication and indicate measurements on Shop Drawings.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating vinyl windows without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to established dimensions.

1.07 WARRANTY:

- H. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace vinyl 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, air infiltration, or condensation.
  - c. Faulty operation of movable sash and hardware.
  - d. Deterioration of vinyl, other materials, and finishes beyond normal weathering.
  - e. Failure of insulating glass.
2. Warranty Period:
- a. Window: Lifetime of original Owner.
  - b. Glazing: **Five** years from date of Substantial Completion.
  - c. Vinyl Finish: Lifetime of original Owner.

PART 2 - PRODUCTS:

2.01 MANUFACTURERS:

- A. Basis-of-Design Product: Subject to compliance with requirements, provide 4300 Newport Series or Series 1746 (non-argon filled) vinyl single hung windows as manufactured by: Moss Supply, 5001 N. Graham Street, Charlotte, NC 28269, Phone: (800) 438-0770 or a comparable product approved prior to bidding.

2.02 MATERIALS

- A. Vinyl Extrusions: Rigid (unplasticized) hollow PVC extrusions, formulated and extruded for exterior applications, complying with AAMA/WDMA 101/I.S.2/NAFS and the following:
- 1. PVC Resins: 100% Virgin PVC compounded with UV Stabilizers and Impact Modifiers
  - 2. PVC Formulation: High impact, low heat buildup, lead free, nonchalking, and color and UV stabilized.
  - 3. Extrusion Wall Thickness: Not less than **0.070 inch**.
  - 4. Multichamber Extrusions: Profile designed with two chambers between interior and exterior faces of the extrusions.
- B. Vinyl Trim and Glazing Stops: Material and finish to match frame members.

- C. Fasteners: Aluminum, nonmagnetic stainless steel, or other materials warranted by manufacturer to be noncorrosive and compatible with vinyl window members, cladding, trim, hardware, anchors, and other components.
  - 1. Exposed Fasteners: Unless unavoidable for applying hardware, do not use exposed fasteners. For application of hardware, use fasteners that match finish of member or hardware being fastened, as appropriate.
- D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- E. Reinforcing Members: Aluminum, or nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- F. Replaceable Weather Seals: Comply with AAMA 701/702.

2.03 WINDOWS:

- A. Window Type: Single hung.
- B. AAMA/WDMA Performance Requirements: Provide vinyl windows of performance indicated that comply with AAMA/WDMA 101/I.S.2/NAFS.
  - 1. Performance Class: **LC**.
- C. Condensation-Resistance Factor (CRF): Provide vinyl windows tested for thermal performance according to AAMA 1503, showing a CRF of **43**.
- D. Thermal Transmittance: Provide vinyl windows with a whole-window, U-factor maximum indicated at 15-mph (24-km/h) exterior wind velocity and winter condition temperatures when tested according to **NFRC 100**.
  - 1. U-Factor: **0.30 Btu/sq. ft. x h x deg F**
- E. Solar Heat-Gain Coefficient (SHGC): Provide vinyl windows with a whole-window SHGC maximum of **0.25**, determined according to NFRC 200 procedures.
- F. Air Infiltration: Maximum rate not more than indicated when tested according to AAMA/WDMA 101/I.S.2/NAFS, Air Infiltration Test.
  - 1. Maximum Rate: 0.3 cfm/sq. ft. of area at an inward test pressure of 1.57 lbf/sq. ft..
- G. Water Resistance: No water leakage as defined in AAMA/WDMA referenced test methods at a water test pressure equaling that indicated, when tested according to AAMA/WDMA 101/I.S.2/NAFS, Water Resistance Test.
  - 1. Test Pressure: 15 percent of positive design pressure, but not less than 2.86 lbf/sq. ft. (140 Pa) or more than 15 lbf/sq. ft. (720 Pa).
- H. Frame Features
  - 1. 3-1/4" deep frame



2. Precision 4-point fusion welded corners
3. Weeped Slope Sill
4. Interior/ Exterior Receptor Groove

I. Sash Features

1. Precision 4-point fusion welded corners
2. Integral lift handle located at the bottom and top of sashes
3. Externally glazed

2.04 GLAZING

- A. Glazing System: Manufacturer's standard 13/16" factory-glazing system with standard internal grids that produces weathertight seal.

1. Low E treated and argon gas filled insulating glazing units

B. Impact Testing:

1. Labeling – Each unit shall bear a permanent label with the manufacturer's name or logo, city, state, model/series, and the following statement: "Miami-Dade County Product Control Approved", unless otherwise noted.

2.05 HARDWARE:

- A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with vinyl; designed to smoothly operate, tightly close, and securely lock vinyl windows, and sized to accommodate sash or ventilator weight and dimensions. Cam Lock with Keeper, dual locks standard over 24" unit width Do not use aluminum in frictional contact with other metals. Where exposed, die-cast zinc with special coating finish.

B. Counterbalancing Mechanism: Comply with AAMA 902.

1. Sash-Balance Type: Constant Force Balance System (1/2" Stainless Steel Coil)

2.06 INSECT SCREENS:

- A. Aluminum Insect Screen Frames: Manufacturer's standard aluminum alloy complying with SMA 1004. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.

1. Aluminum Tubular Framing Sections and Cross Braces: 7/16" x 3/4" Roll formed
2. Finish: Manufacturer's standard.

- B. Glass-Fiber Mesh Fabric: 18-by-16 mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration, in the following color. Comply with ASTM D 3656.

1. Mesh Color: Charcoal gray.

2.07 ACCESSORIES:

- A. Dividers (False Muntins): Provide dividers in designs indicated for upper sash lite, one permanently located between glazing lites in the airspace.

1. Material: Extruded, rigid PVC.
2. Design: Rectangular.
3. Color: White.

## 2.08 FABRICATION:

- A. Fabricate vinyl windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
  1. Welded Frame and Sash/Ventilator Corners: Miter-cut and welded.
- C. Fabricate vinyl windows that are reglazable without dismantling sash or ventilator framing.
- D. Weather Stripping: Sash continuously sealed along front and sides with Fin-Seal weather stripping and finished at the bottom with a custom extruded flexible PVC bulb seal for positive sash to sill closure.
- E. Mullions: Provide mullions and cover plates as shown, compatible with window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units. Provide manufacturer's standard finish to match window units.
- F. Factory-Glazed Fabrication: Except for light sizes in excess of 100 united inches (2500 mm width plus length), glaze vinyl windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 8 Section "Glazing" and with AAMA/WDMA 101/I.S.2/NAFS.
- G. Glazing Stops: Provide nailed or snap-on glazing stops coordinated with Division 8 Section "Glazing" and glazing system indicated. Provide glazing stops to match sash and ventilator frames.
- H. Hardware: Mount hardware through double walls of vinyl extrusions or provide corrosion-resistant steel reinforcement complying with requirements for reinforcing members, or do both.
- I. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

## 2.09 VINYL FINISHES

- A. Integral Finish and Color: Uniform, solid, homogeneous white or beige color by Owner interior and exterior.

## PART 3 - EXECUTION:

### 3.01 EXAMINATION:

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate, and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weathertight window installation.
  1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.

2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.
- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with peel and stick flashing, as indicated, for weathertight construction.
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

### 3.03 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.
- B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- C. Clean factory-glazed glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- E. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

End of Section

## SECTION 08 41 13 - ALUMINUM ENTRANCES AND STOREFRONTS

### PART I - GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, material, equipment, and supervision to provide, fabricate, and install aluminum/glass doors, hardware, thermally-broken aluminum framing, and as listed herein and shown on the drawings.

#### 1.02 GENERAL:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section	06 10 00	Rough Carpentry
Section	07 92 00	Sealants and Caulking
Section	08 71 80	Finish Hardware
Section	08 80 00	Glazing
Section	09 29 00	Gypsum Wallboard

#### 1.03 SUBMITTALS:

- A. Product Data: Submit manufacturer's product specifications, technical product data, standard details, and installation recommendations for each type of entrance and storefront product required. Include the following information:

1. Fabrication methods
2. Finishing
3. Hardware
4. Accessories

- B. Shop Drawings: Submit shop drawings for fabrication and installation of entrances and storefronts, including the following:

1. Elevations
2. Detail sections of typical composite members.
3. Hardware, mounting heights
4. Anchorages and reinforcements
5. Expansion provisions
6. Glazing details

- C. Certification: Provide certified test results showing that entrance and storefront systems have been tested by a recognized testing laboratory or agency and comply with specified performance characteristics.

#### 1.04 QUALITY ASSURANCE:

- A. Manufacturer's Qualifications: Entrances and storefront shall be installed by a firm that has not less than 5 years successful experience in the installation of systems similar to those required.
- B. Installer's Qualifications: Entrances and storefront shall be installed by a firm that has not less than 5 years successful experience in the installation of systems similar to those required.
- C. Design Criteria: Drawings are based on one manufacturer's entrance and storefront system. Another manufacturer's system of a similar and equivalent nature will be acceptable when, in the Architect's sole judgment, differences do not materially detract from the design concept or intended performance.

1.05 PROJECT CONDITIONS:

- A. Field Measurements: Check openings by field measurement before fabrication to ensure proper fitting of work; show measurements on final shop drawings. Coordinate fabrications schedule with construction progress to avoid delay in the work. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit.

1.06 WARRANTY:

- A. Warranty period for aluminum entrances and storefront is 3 years after the date of substantial completion.

PART II PRODUCTS

2.01 SYSTEM DESCRIPTION:

- A. Performance Requirements: Provide aluminum entrance and storefront assemblies that comply with specified performance characteristics. Each system shall be tested by a recognized testing laboratory or agency in accordance with specified test methods. Provide certified test results.
- B. Thermal Movement: Provide systems capable of withstanding thermal movements resulting from an ambient temperature range of 120° F (67° C), that could cause a metal surface temperature range of 180° F (100° C) within the framing system.
- C. Wind Loading: Provide assemblies capable of withstanding a uniform test pressure of 20 psf inward and 20 psf outward when tested in accordance with ASTM E 330.
- D. Fixed Framing Transmission Characteristics: Provide aluminum entrance and storefront framing system that complies with requirements indicated for transmission characteristics.
- E. Air Infiltration: Provide framing system with an air infiltration rate of not more than 0.06 CFM per sq. ft. of fixed area (excluding operable door edges) when tested in accordance with ASTM E 283 at an inward test pressure differential of 6.24 psf.
- F. Water Penetration: Provide framing systems with no water penetration (excluding operable door edges) as defined in the test method when tested in accordance with ASTM E 331 at an inward test pressure differential of 6.24 lbf. per sq. ft.
- G. Aluminum Entrance Transmission Characteristics: Provide entrance doors with jamb and head frames that comply with requirements indicated for transmission characteristics.
- H. Air Infiltration: Provide doors with an air infiltration rate of not more than 0.50 CFM for single doors and 1.0 for pairs of doors when tested in accordance with ASTM E 283 at an inward test pressure differential of 1.567 psf.

2.02 STOREFRONT/ENTRANCE MANUFACTURERS:

- A. Provide complete system meeting the specified requirements as manufactured by one of the following approved manufacturers:
  - 1. United States Aluminum Corporation
  - 2. Wausau Window and Wall Systems
  - 3. Kawneer Company, Inc.
  - 4. Vistawall Architectural Products
  - 5. YKK AP America Inc.
  - 6. Tubelite
  - 7. Oldcastle Building Envelope
  - 8. EFCO Corporation

9. Doralco Architectural Metal Solutions

2.03 MATERIALS:

- A. Storefront/Entrance Members: Provide aluminum alloy 6063-T5 with ASTM B 221 for extrusions and ASTM B 209 for sheet or plate. Wall thickness of all door sections, except glazing beads, shall be .125" minimum. Wall thickness of frame members, except glazing beads and glazing pockets, shall be .125" minimum.
- B. Fasteners: Provide fasteners of aluminum, nonmagnetic stainless steel, or other materials warranted by the manufacturer to be non-corrosive and compatible with aluminum components, hardware, anchors and other components.
- C. Reinforcement: Where fasteners crew-anchor into aluminum less than 0.125" thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard non-corrosive pressed-in splined grommet nuts.
- D. Exposed Fasteners: Except where unavoidable for application of hardware, do not use exposed fasteners. For the application of hardware, use fasteners that match the finish of member or hardware being fastened.
- E. Provide Phillips flat-head machine screws for exposed fasteners.
- F. Concealed Flashing: Provide 26 gauge minimum dead-soft stainless steel, or 0.026" minimum extruded aluminum of alloy and type selected by manufacturer for compatibility with other components.
- G. Brackets and Reinforcements: Where feasible, provide high-strength aluminum brackets and reinforcements; otherwise provide nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A 386.
- H. Concrete/Masonry Inserts: Provide concrete and masonry inserts fabricated from cast-iron, malleable iron, or hot-dip galvanized steel complying with ASTM A 386.
- I. Compression Weatherstripping: Provide the manufacturer's standard replaceable compressible weatherstripping gaskets of molded neoprene complying with ASTM D 2000 or molded PVC complying with ASTM D 2287.
- J. Thermal Break with a 1/4" (6.4 mm) separation consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
- K. Glass and Glazing Materials: Glass and glazing materials shall comply with requirements of Glazing section of these specifications.

2.04 COMPONENTS:

- A. Storefront Framing System: Provide inside-outside matched resilient flush-glazed storefront framing system meeting or exceeding the properties of Trifab VG 451T as manufactured by Kawneer for 1" insulated glazing. Frames and side lights shall be accurately joined at corners with unexposed screws in extruded splines, which are an integral part of all horizontal members. All glazing shall be flush, including the horizontal muntins and sills. Glass shall be held in place by a glazing vinyl on both sides of glass for puttyless glazing. An expansion mullion shall be provided for every 30 lineal feet of continuous frames.

- B. Aluminum Door Frames: Fabricate tubular and channel frame assemblies, as indicated, with welded or mechanical joints in accordance with manufacturer's standards; reinforce as necessary to support required loads.
- C. Stile and Rail Type Aluminum Doors:
  - 1. Frame: Provide tubular frame members, fabricated with mechanical joints using heavy inserted reinforcing plates and concealed tie-rods or j-bolts.
  - 2. Design: Provide 1-3/4" thick, Medium Stile doors meeting or exceeding the properties of #400 Medium Stile Mid Panel Panic door as manufactured by U.S. Aluminum. Bottom rail shall be 10".

2.05 FINISHES:

- A. High-Performance Organic Finish (2-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA **2605** and with coating and resin manufacturers' written instructions.
  - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

2.06 STOREFRONT/ENTRANCE HARDWARE:

- A. General: Refer to hardware section in Division 8 for requirements for hardware items indicated to be provided by the Finish Hardware supplier.
- B. Provide manufacturer's Type 10 heavy-duty hardware units as indicated, scheduled, or required for operation of each door, including the following items of sizes, number, and type recommended by manufacturer for service required; finish to match door.
- C. Offset Pivots: ANSI/BHMA A156.4, Grade 1 with exposed parts of cast aluminum alloy. Provide top, bottom, and intermediate pivots at each door leaf.
- D. Butt Hinges: BHMA A156.1, Grade 1, radius corner.
  - 1. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while entrance door is closed.
  - 2. Exterior Hinges: Stainless steel, with stainless-steel pin
  - 3. Quantities:
    - a. For doors up to **87 inches (2210 mm)** high, provide 3 hinges per leaf.
    - b. For doors more than **87 and up to 120 inches (2210 and up to 3048 mm)** high, provide 4 hinges per leaf.
- E. Surface-Mounted Overhead Closers: Provide surface-mounted overhead closers; modern type with cover, for hinge side installation; comply with ANSI A156.4, Grade 1. Comply with manufacturer's recommendations for size of closer, depending on door size, exposure to weather and anticipated frequency of use.
- F. Door Stop - Provide floor or wall mounted door stop, as appropriate, with integral rubber bumper; comply with ANSI A156.16, Grade 1.
- G. Deadlocks: Provide mortised maximum security type deadlocks, with minimum 1" long pivoted bolt and stainless steel strike box; comply with ANSI A156.5, Grade 1.

- H. Push/Pull Handles: Provide No. PR032 pull and No. PR031 push set in US26D Satin Chrome finish.
- I. Thresholds: Provide extruded aluminum panic threshold with compressible bulb weatherstrip similar to National Guard 896 V of size required in mill finish, complete with anchors and clips, coordinated with pivots and floor-concealed closers. Maximum height of threshold to be ½" to be in compliance with ADA.

### PART III EXECUTION

#### 3.01 EXAMINATION

- A. Swing/fold doors: Because of the large dimensions involved and the weight and movement of the panels, verify the structural integrity of the header with the deflection limited to less than L/720 of the span with a maximum deflection of 3/8".
- B. Examine surfaces of openings and verify dimensions; verify rough openings are level, plumb, and square, with no unevenness, bowing, or bumps on floor.
- C. Installation of units constitutes acceptance of existing conditions.

#### 3.02 FABRICATION:

- A. General: Sizes of door and frame units and profile requirements are indicated on drawings. Variable dimensions are indicated, with maximum and minimum dimensions required to achieve design requirements and coordination with other work.
- B. Prefabrication: Before shipment to the project site, complete fabrication, assembly, finishing, hardware application, and other work to the greatest extent possible. Disassemble components only as necessary for shipment and installation.
- C. Pre-glaze door and frame units to greatest extent possible.
- D. Do not drill and tap for surface-mounted hardware items until time of installation at project site.
- E. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work to prevent damage to exposed finish surfaces. For hardware, perform these operations prior to application of finishes.
- F. Welding: Comply with AWS Recommendations; grind exposed welds smooth and restore mechanical finish.
- G. Reinforcing: Install reinforcing as required for hardware and necessary for performance requirements, sag resistance and rigidity.
- H. Dissimilar Metals: Separate dissimilar metals with zinc chromate primer, bituminous paint, or other separator that will prevent corrosion.
- I. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.
- J. Uniformity of Finish: Abutting extrude aluminum members shall not have an integral color or texture variation greater than half the range indicated in the sample pair submittal.
- K. Fasteners: Conceal fasteners wherever possible.
- L. Weatherstripping: For exterior doors, provide compression weatherstripping against fixed stops; at other edges, provide sliding weatherstripping retained in adjustable strip mortised into door edge.



- M. Provide EPDM or vinyl blade gasket weatherstripping in bottom door rail, adjustable for contact with threshold.
- N. At interior doors and other locations without weatherstripping, provide neoprene silencers on stops to prevent metal-to-metal contact.

3.03 INSTALLATION:

- A. Comply with manufacturer's instructions and recommendations for installation.
- B. Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Provide proper support and anchor securely in place.
- C. Separate aluminum and other corrodible metal surfaces from sources of corrosion of electrolytic action at points of contact with other materials. Comply with requirements specified under paragraph "Dissimilar Materials" in the Appendix to AAMA 101-85.
- D. Drill and tap frames and doors and apply surface-mounted hardware items. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.
- E. Set sill members and other members in bed of sealant as indicated, or with joint fillers or gaskets as indicated to provide weathertight construction. Comply with requirements of Division 7 for sealants, fillers, and gaskets.
- F. Refer to "Glass and Glazing" section of Division 8 for installation of glass and other panels indicated to be glazed into doors and framing, and not preglazed by manufacturer.
- G. Where required by the details, provide column covers of 0.040" aluminum finished to match storefront material. Provide profiles as detailed.
- H. Continuous along the bottom of all openings provide 0.040" aluminum field flashing.
- I. If necessary, provide drain connections from lower track.

3.04 ADJUSTING:

- A. Adjusting operating hardware to function properly for smooth operation without binding, and for weathertight closure.

3.05 CLEANING:

- A. Clean the complete system, inside and out, upon completion of construction, exercising care to avoid damage to coatings.
- B. Clean glass surfaces after installation, complying with requirements contained in the "Glass and Glazing" section for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

3.06 PROTECTION:

- A. Institute protective measures required throughout the remainder of the construction period to ensure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.

End of Section

## SECTION 08 71 80 – RESIDENTIAL FINISH HARDWARE

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, tools, equipment, and supervision as required to properly and completely equip all doors as shown on the drawings and specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, supplemental Conditions and Division 1, General Requirements, apply to the work under this section.

Section	08 11 16	Metal Swinging Patio Doors
Section	08 11 50	Exterior Doors
Section	08 14 20	Wood Doors

#### 1.03 QUALITY ASSURANCE:

- A Obtain each type of Hardware (i.e. locks) from a single manufacturer.
- B "Supplier" refers to a recognized architectural hardware supplier, with warehouse facilities, furnishing hardware for not less than 2 years in the project's vicinity. Supplier must be or employ a full time experienced Architectural Hardware Consultant (AHC – Certified by the Door and Hardware Institute) who, at reasonable times during the course of the work, is available for consultation with the Owner, Architect and Contractor about the project's requirements.

#### 1.04 SUBMITTALS:

- A Submit hardware schedule in manner indicated below. Coordinate hardware with doors, frames, and related work to insure proper size, thickness, hand, function and finish of hardware.
- B Final Hardware Schedule: Based on finish hardware, organize a schedule into "hardware sets" containing all items required for each door or opening. Include the following information:
1. Type, style, function, size, finish and manufacturer of each hardware item.
  2. Explanation of abbreviations, symbols, codes, etc. contained in schedule.
  3. Fastening and other pertinent information.
  4. Location of hardware set cross-referenced to drawings.
  5. Mounting locations for hardware.
  6. Door frame size and material.
  7. Keying information.
- C Submit schedule at earliest possible date since acceptance of hardware schedule must precede fabrication of other work (i.e. prehung doors and frames) critical to construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to a coordinated review of hardware schedule.
- D Furnish templates to fabricators of doors, frames, and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of each other's work, to confirm that adequate provisions are made for proper location and installation of hardware.
- E No hardware shall be ordered until hardware schedule has been approved by the Architect.
- #### 1.05 PACKING AND MARKING:
- A All hardware shall have the required screws, bolts, and other fasteners necessary for its installation packed in the same package as the hardware. Each package shall be legibly and adequately labeled

to indicate the part of the work for which it is intended.

- B Hardware shall include such adjusting tools and instructions as furnished by the manufacturer as standard practice. Upon completion of the work, the Contractor shall turn over to the Owner or his representative all such tools, instructions and emergency keys.

## PART II PRODUCTS

### 2.01 GENERAL:

- A Coordinate finish hardware work with work of other trades as required.
- B Cooperate with Finish Hardware supplier in scheduling dates for submittals and delivery of templates and finish hardware.

### 2.02 MATERIALS:

- A Catalog Numbers:

Catalog numbers used in the schedule are as follows:

Butts	Complete with prehung door units
Locksets & Deadbolts	Kwickset (Faultless, Westlock, Weiser and Sargent are acceptable)
Cylinders	Best Access Systems Premium Keyway "WH"
Stops & Flush Bolts	H. B. Ives Co. (Hager, Trimco, or Rockwood are acceptable)
Thresholds, Weatherstrip	Complete with Prehung door units
Knocker/Peep	H. B. Ives (Faultless and Solar Hardware Co. are acceptable)
Closer	Yale (Faultless, Sargent and Russwin are acceptable)

- B Labeled Doors:

1. Hardware for labeled fire doors shall be UL listed and shall be labeled where required by NFPA standards.

- C Maintenance Requirements: Furnish a complete set of specialized tools and instructions for maintenance, adjustment, removal and replacement.

### 2.03 FINISH:

- A Finish to be Satin Nickel for all items unless otherwise noted.

### 2.04 LOCKSETS:

- A Apartments

1. Locks to have Abbey design.
2. Deadbolts to be grade 3 minimum with Bel Air design
3. All ground floor entry doors, doors to HC units, doors to common use areas and maintenance room doors to have lever type hardware.

### 2.05 PEEP:

- A Provide additional peep for handicap entry doors at 46" above the floor.

### 2.06 DOOR CLOSERS:

- A Rack and pinion construction of heat treated steel.
- B Case cast of hydraulic iron.

- C Controlled with fully adjustable backcheck.
- D Concealed needle valves.
- E Surface applied with rectangular cover, projection not more than 2-3/4".
- F Capable of being applied on 1-3/4" top rail or top jamb.
- G 5-year guarantee from the manufacturer.

2.07 KEYING:

- A All entry locks shall be keyed differently than the master key.
- B Provide two (2) keys per lockset and six (6) master keys.
- C All patio door deadbolts shall be keyed similar to entry deadbolts
- D Deliver permanent keys direct from the manufacturer to the Owner.

2.08 KEY CABINET:

- A Provide complete with all system components and instructions. Cabinet capacity shall be 50% in excess of actual requirements.
- B Approved manufacturer: Telkee.

PART III EXECUTION:

3.01 INSTALLATION:

- A Locations of hardware shall be in accordance with the recommendations of the National Builders Hardware Association for detailed locations.
- B Install hardware in accurate conformity with the manufacturer's templates.
- C Lock trim shall be as listed in schedule, or equivalent of other approved manufacturers. Dummy trim levers and roses shall be identical to those supplied with locksets. All locksets shall be beveled 1/8" in 2".

3.02 ADJUSTMENT AND CLEANING:

- A Check and adjust each operating item to ensure proper functioning of each unit. Replace units which cannot be adjusted to operate properly.
- B Clean adjacent surfaces soiled by hardware installation.
- C Whenever hardware installation is completed more than one month prior to acceptance or occupancy of building or space, during the week prior to acceptance or occupancy, make final check and adjustment of all items. Clean operating items and restore proper function and finish of hardware and doors. Adjust door control devices to compensate for permanent heating and ventilating conditions.
- D During final adjustment of hardware, instruct Owner's personnel in proper adjustment and maintenance procedures for hardware operations and finished.

3.03 SCHEDULE OF DOOR HARDWARE:

- A Apartments:

#### Entrance Doors

Each to have:

1	passage	720 (220)
1	deadlock	970
1	door knocker/viewer	(Provide additional for handicap units)
1	set weatherstrip and threshold	(furnished with door)
1	set butts, 2 sets spring loaded hinges	at breezeway doors
1	stop	

#### Bedroom and Bathroom Doors

1	privacy	300
1	pr. butts	(butts furnished with prehung door)
1	stop	

#### Closet Doors (If indicated on drawings to be a pair)

Magnetic catch mounted at door head for each leaf

1	dummy	788 (488 KNL at handicap units)
1	stop	

#### Closet Doors (If indicated on drawings to be single, swinging door)

1	passage	200 (200 KNL at handicap units)
1	pr. butts	(butts furnished with prehung door)
1	stop	

#### Patio Doors

1	passage	720 (200 DL at handicap units)
1	deadbolt	970
1.5	pr. butts	(butts and threshold furnished with door)
1	stop	

#### Exterior Sprinkler Closet Doors

1	keylock	740 (400 KNL at handicap units)
1.5	pr. butts	(butts furnished with prehung door units)
1	set weatherstripping and threshold	(furnished with door)

End of Section

## SECTION 08 80 00 - GLAZING

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials and equipment, and perform all work to install glass in doors, in windows in exterior walls, and in fixed-glass hollow metal view windows on the interior.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section	07 92 00	Sealants and Caulking
Section	08 15 80	Vinyl Windows
Section	08 41 13	Aluminum Entrances and Storefronts

#### 1.03 QUALITY OF GLASS:

- A Glass shall meet or exceed the requirements of Federal Specifications DD-G-451C and each piece of glass shall bear factory applied label. Tempered glass shall meet the requirements of Federal Specification DD-G-1403B. Glass shall meet or exceed the specified requirements and properties of PPG Industries, Inc.; Libby-Owens-Ford Company; or ASG Industries.
- B Provide insulating glass units permanently marked either on spacers or at least one component lite of units with appropriate certification label of the Insulating Glass Certification Council. (IGCC).

#### 1.04 SUBMITTALS:

- A Product Data: For each glass product and glazing material indicated.
- B Samples: For the following products, in the form of 12-inch- (300-mm-) square Samples for glass.
1. Each color of tinted float glass.
  2. Coated vision glass.
  3. Wired glass.
  4. Insulating glass for each designation indicated.
- C Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- D For solar-control low-e-coated glass, provide documentation demonstrating that manufacturer of coated glass is certified by coating manufacturer.
- E Qualification Data: For installers.

#### 1.05 WARRANTY:

- A Submit written warranty signed by manufacturer of insulating glass agreeing to furnish replacements for insulating glass units that suffer failure of seal (as indicated by dust accumulation on inner surfaces, fogging, or accumulation of vision obstructing film on inner surfaces) during normal usage due to causes other than breakage, improper maintenance, or improper cleaning. Replacements shall be furnished F.O.B. point of manufacturer, freight allowed Project site, within the specified warranty period indicated below
1. Insulated Glass: Manufacturer's standard, ten year minimum period.
  2. Float Glass: Manufacturer's standard, five year minimum period.

3. Laminated Glass: Manufacturer's standard, five year minimum period.
4. Mirrors: Manufacturer's standard fifteen year period protecting against silver spoilage

## PART II PRODUCTS

### 2.01 TYPES OF GLASS:

- A Glass for use in exterior entrance doors and elsewhere as required by Federal and State Safety Glazing Laws shall be tempered safety glass conforming to requirements of Federal Safety Standard 16CFR1201.
- B. Tinted glass in exterior vision windows shall be Twindow 1" thick (or thickness indicated on drawings) insulated glass with 1/2" air space and two 1/4" Lites, interior lite clear, exterior lite solar gray, as manufactured by PPG Industries and shall meet the certification requirements of I.G.C.C. for a Class CBA rating. Glass shall meet the quality criteria of Federal Specification DD-G-451D. Coatings shall be applied under controlled factory conditions of the manufacturer.
  1. Low-E Coating or Film: Pyrolytic or sputtered on second or third surface.
  2. Low-E Insulating glass units shall have a Maximum U value of 0.25, a Maximum Shading Coefficient of 0.37 and a Maximum Solar Heat Gain Coefficient of 0.25
- B Mirrors: Tempered float glass with successive layers of chemically deposited silver, electrically or chemically deposited copper, and manufacturer's standard organic protective coating applied to glass surface to produce a coating system complying with FS DD-M-411.
  1. Cut mirrored glass to final sizes and shapes to suit Project conditions.
  2. Treat edges with flat polished edge.
  3. Seal edges of silvered mirrored glass after edge treatment to prevent chemical or atmospheric penetration of glass coating.
  4. Require mirrored glass manufacturer to perform edge treatment and sealing in factory immediately after cutting to final sizes.

### 2.02 GLASS SIZES:

- A Obtain glass sizes at the building or from manufacturer of frames and sashes into which glass is to be set. Responsibility for correct glass size rests with the Contractor.

### 2.03 GLAZING MATERIAL:

- A Unless factory glazing is provided, elastic glazing compound shall be Pecora Chemical Company Challen Glazing Compound M-251, or products of Tremco or DAP meeting or exceeding the specified requirements. Butyl tape shall be Tremco Polyshim Tape or product by approved manufacturer meeting or exceeding the specified requirements.

## PART III EXECUTION

### 3.01 GLAZING:

- A Bottom of glass shall be set on wood or plastic setting blocks and similar spacers shall be used at vertical edges of glass to maintain proper clearance from metal and wood frames.
- B In hollow metal glass window frames and doors, bed glass in elastic glazing compound to prevent rattling and carefully install removable metal glazing beads. On exterior doors and windows, back-putty glazing bead to insure watertightness.

- C Glazing shall not be done when temperature is below 40° F. Sash and frames shall be dry and free from dust when glazed. Remove all excess glazing compound and stains from sash, frames and glass immediately after glazing.
- D Glazing procedures shall conform to recommendations outlined in the Glazing Manual of the Flat Glass Marketing Association. Basic points of good practice shall include: clean cut edges, no nipping or seamed edges, edge openings in a true plane, and resilient setting blocks at quarter points.
- E Seal joints between pieces of butt-jointed glass with clear silicone sealant GE Silicone Sealant RVT108 or Tremco Spectrem 2.

3.02 GLASS BREAKAGE:

- A Replace all breakage caused in executing the work or by faulty installation. Improperly set glass or glass which does not fully meet the requirements for its grade will not be accepted. At completion of work, glass shall be whole and free from cracks, scratches, and rattles.

3.03 CLEANING:

- A Just before final inspection of the building, clean and wash glass and remove all labels.

End of Section



## SECTION 09 29 00 - GYPSUM WALLBOARD

### 1 PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials and equipment, and perform all work to install Gypsum Wallboard exposed ceilings, furr-downs and wallboard, including all miscellaneous trim and accessories as required for a complete installation.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements apply to the work under this section.

Section	06 10 00	Rough Carpentry
Section	07 92 00	Caulking and Sealants
Section	09 91 00	Painting

#### 1.03 SUBMITTALS:

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations, fabrication, and installation of control and expansion joints including plans, elevations, sections, component details and attachments to other units of Work.
- C. Textured Finish Samples: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.

#### 1.04 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 E119 by independent testing and inspecting agency acceptable to authorities having jurisdiction. Fire-Resistance-Rated Assemblies are indicated on drawings by design designations from UL's "Fire Resistance Directory.
- 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.
  - 1. STC-Rated Assemblies: Indicated by design designations from GA-600, "Fire Resistance Design Manual."
- C. Gypsum Board Finish Mockups: Before finishing gypsum board assemblies, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and qualities of materials and execution.
  - 1. Install mockups for surfaces with textured finishes and/or textured paint finishes.
  - 2. Simulate finished lighting conditions for review of mockups.
  - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.

1.06 PROJECT CONDITIONS:

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

2 PART II PRODUCTS

2.01 MANUFACTURERS:

- A. Materials shall be products of United States Gypsum Company as listed or products of CertainTeed Gypsum, Georgia-Pacific, Lafarge North America, or National Gypsum Company meeting or exceeding specified requirements.

2.02 GYPSUM BOARD AND ACCESSORIES:

- A. Fire rated Gypsum Board shall be fire-rated 5/8" thick, Type "X" Gypsum panels, unless otherwise noted on the drawings. Non Fire-rated wallboard shall be 5/8" thick Gypsum panels unless otherwise noted. All wallboard shall be 4'-0" wide and most economical lengths to suit building conditions. Ceilings shall receive 5/8" Gypsum panels unless otherwise notes.
- B. Abuse resistant Gypsum Board shall be 5/8 inch thick Fiberock® abuse resistant panels as manufactured by United States Gypsum Company as listed or products of Georgia-Pacific, Lafarge North America, Gold Bond Building Products, the Flintkote Company, Bostwick, or Allied Structural Industries meeting or exceeding specified requirements, except as specifically noted otherwise.
- C. Accessories:
  - 1. Cornerbeads for all external corners shall be USG Dur-A-Bead No. 103 (1-1/4" x 1-1/4").
  - 2. Metal trim for edges of wallboard abutting masonry, plaster or metal wall surfaces shall be USG No. 200-A.
  - 3. Control Joint Trim shall be zinc control joint USG No. 093.
- D. Materials for exposed joint treatment shall be USG Perf-A-Tape Dura-bond Compound Taping, Dura-bond 90 Joint Compound, and USG Ready-mixed Joint Compound Topping.
- E. Wallboard in Toilets and elsewhere as noted on the drawings shall be paperless gypsum board similar to 5/8 inch thick DensArmor Plus® panels as manufactured by Georgia Pacific Corporation as listed or products of CertainTeed Gypsum, U S Gypsum Co., Lafarge North America, National Gypsum Company meeting or exceeding specified requirements. Use Finish level 5 on all paperless gypsum board installations.
  - 1. Thickness: 5/8 inch.
  - 2. Width: 4 feet.
  - 3. Length: 8 feet.
  - 4. Weight: 2570 pounds per M square feet.
  - 5. Edges: Tapered.
  - 6. Surfacing: Coated glass mat on face, back, and long edges.
  - 7. Flexural Strength, Parallel (ASTM C473, ASTM C1396): Not less than 100 lbf.
  - 8. Flexural Strength, Perpendicular (ASTM C473, ASTM C1177): Not less than 140 lbf.
  - 9. R-Value (ASTM C518): Not less than 0.67.
  - 10. Nail Pull Resistance (ASTM C473, ASTM C1177): Not less than 90 lbf.
  - 11. Humidified Deflection (ASTM C79, ASTM C473 and ASTM C1177): Not more than 1/8 inch.
  - 12. Hardness, Core, Edges, and Ends (ASTM C473, ASTM C1396): Not less than 15.
  - 13. Water Absorption (ASTM C473, ASTM C630 and ASTM C1396): Less than 5% of weight.

14. Mold Resistance (ASTM D3273): 10, in a test as manufactured.

## 2.03 ACOUSTICAL SEALANT

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Acoustical Sealant for Exposed and Concealed Joints:
  - a. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
  - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
  - c. Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

## 2.04 TEXTURE FINISHES:

- A. Products: Subject to compliance with requirements, provide one of the following where noted on the drawings:
1. G-P Gypsum Corp.; GyProc Vermiculite Ceiling Texture.
  2. United States Gypsum Co.; SHEETROCK Wall and Ceiling Spray Texture (Aggregated).
- B. Primer: As recommended by textured finish manufacturer.
- C. Aggregate Finish: Water-based, job-mixed, aggregated, drying-type texture finish for spray application.
- D. Texture for all walls and ceilings: Knock-down

## 2.05 AUXILIARY MATERIALS::

- A. Isolation strip at exterior walls: Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.

# 3 PART III EXECUTION

## 3.01 INSTALLATION - GENERAL:

- A. The installation of Gypsum board shall conform to applicable provisions of Gypsum Board Application and Finishing Standards: ASTM C 840 and GA-216, the recommended specifications of the Gypsum board manufacturer and to underwriter's laboratory. Refer to UL Assembly installation requirements at fire-rated partitions.
- B. At all fire-rated partitions the wallboard shall extend to the roof deck above. At all non-rated partitions the wallboard shall extend to a minimum of 6 inches above the ceiling.
- C. Where fixtures or accessories are recessed into rated partitions, take caution and do work necessary to maintain the fire rating of the partition.
- D. Apply W/R sealant to all cut or exposed edges of W/R panels prior to installing.
- E. Furr out around Columns, and thicken partitions at electrical panels, alarm panels, columns, piping ductwork and other items as required.
- F. Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.

- G. 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.
- H. Install gypsum panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- I. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- J. Attach gypsum panels to framing provided at openings and cutouts.
- K. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members using resilient channels, or provide control joints to counteract wood shrinkage.
- L. Form control and expansion joints with space between edges of adjoining gypsum panels.
- M. Fit gypsum panels around ducts, pipes, and conduits.
- N. Where partitions intersect open concrete coffer, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffer, joists, and other structural members; allow 1/4 to 3/8-inch-wide joints to install sealant.
- O. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors. 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.
- P. Floating Construction: Where feasible, including where recommended in writing by manufacturer, install gypsum panels over wood framing, with floating internal corner construction.
- Q. STC-Rated Assemblies: Seal construction at perimeters, behind control and expansion joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.
- R. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.
- S. Apply Gypsum panels parallel to studs, perpendicular to resilient channels. Position all edges over studs. Fit ends and edges closely, but not forced together. Stagger joints on opposite sides of partition. Fasten panels to studs with 1" Type S Bugle Head Screws 8" on center at vertical joints, in field, and to door head and ceiling runners.
- T. Power drive at least 3/8" from edges and ends of Gypsum panels to provide uniform dimple 1/32" deep.

### 3.02 PANEL APPLICATION METHODS:

- A. Single-Layer Application:
  - 1. On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.

2. On partitions/walls, apply gypsum panels perpendicular to framing, unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
3. Stagger abutting end joints not less than one framing member in alternate courses of board.
4. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
5. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
  - a. Multilayer Application on Ceilings: Apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
  - b. Multilayer Application on Partitions/Walls: Apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
    - i. Z-Furring Members: Apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
  - c. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.
  - d. Multilayer Fastening Methods: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners unless specified assembly requires fastening base layers and face layers separately to supports with screws.
  - e. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.
  - f. Exterior Soffits and Ceilings: Apply exterior gypsum soffit board panels perpendicular to supports, with end joints staggered and located over supports.
    - i. Fasten with corrosion-resistant screws.

### 3.03 INSTALLING TRIM ACCESSORIES:

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect. Provide gypsum board backing at control installed in fire rated partitions in accordance with manufacturer's recommendations and as required to maintain the rating specified. Install control joints in the following locations if not specifically located on the drawings:
  1. In partition or furring runs at 30 feet on center maximum.
  2. In ceilings where dimensions exceed 30 feet in either direction maximum.

3. In ceilings at ridge lines or at change of slope.
  4. In exterior gypsum board soffits that exceed 30 feet in either direction maximum.
  5. Where wings of "L", "U", and "T" shaped ceiling areas are joined.
  6. Expansion or control joints that occur throughout the building itself.
  7. Less-than-ceiling height door and window frames should have control joints extending to the ceiling from both corners. Ceiling height door and window frames may be used as control joints.
  8. Install backer rod and sealant behind control joints in wall noted on the drawings to contain sound insulation or to include resilient channels in the wall assembly.
- C. Cornerbeads shall be installed at all exterior corners attached with screws or 9/16" rosin-coated staples 9" o.c. Cornerbeads shall be in single lengths except where corner exceeds standard stock lengths. Clinch-on cornerbeads shall not be allowed.
- D. Casing beads shall be installed where gypsum board abutts masonry walls.

#### 3.04 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture finish manufacturer's written recommendations.

#### 3.05 FINISHING GYPSUM BOARD ASSEMBLIES:

- 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. In sanding jointing compound, care shall be taken not to sand exposed face of Gypsum board and raise a knap on the paper covering.
- E. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:
1. Level 1: Embed tape at joints. **Use this finish level in ceiling plenum areas not exposed to view, concealed areas, and elsewhere as indicated.**
  2. Level 2: Embed tape and apply separate first coat of joint compound to tape, fasteners and trim flanges. **Use this finish level where panels are substrate for tile and elsewhere as indicated.**
  3. Level 3: Embed tape and apply separate first and fill coats of joint compound to tape, fasteners, and trim flanges. **Use this finish level where indicated.**

4. Level 4: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges. **Use this finish level at panel surfaces that will be exposed to view or covered with flexible wall coverings unless otherwise indicated.**
5. Level 5: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges, and apply skim coat of joint compound over entire surface. **Use this finish level at panel surfaces to be painted with semi-gloss or gloss paint.**

3.06 PROTECTION:

- A. During Gypsum panel application and joint finishing, temperatures within the buildings shall be maintained within the range of 55°F to 70°F. Adequate ventilation shall be provided to carry off excess moisture.
- B. All materials shall be delivered to the buildings in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

3.08 CLEANUP:

- A. Upon completion of work, remove all drywall debris and scrap materials from the premises and site.

End of Section

## SECTION 09 30 00 - CERAMIC TILE

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, equipment, and supervision necessary to provide and install ceramic tile flooring as shown on the drawings and specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBMITTALS:

- A Provide manufacturer's data and samples for all tile and accessories specified.
- B Submit shop drawings for the following: Tile patterns and layouts, widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C Submit grout samples consisting of actual sections of grout showing the full range of colors available for each type of grout indicated for color selection
- D Submit Master Grade Certificates: For each shipment, type, and composition of tile, signed by the tile manufacturer and installer.

#### 1.04 QUALITY ASSURANCE:

- A Installer Qualifications: Engage an experienced installer who has completed tile installations similar in material design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B Source Limitations for Tile: Obtain each color, grade, finish, type, composition, and variety of tile from one source with resources to provide products from the same production run for each contiguous area of consistent quality in appearance and physical properties without delaying the Work.
- C Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.
- D Comply with "Handbook for Ceramic Tile Installation" (latest edition) as published by the Tile Council of America, Inc. (TCA).

#### 1.05 PREPARATION OF SURFACES:

- A Surfaces to which ceramic tile is to be applied shall be free from dust, loose particles, grease, paint, and similar matter that would interfere with bonding of setting material.
- B Tile Contractor shall inspect job conditions affecting installation of tile prior to beginning work and shall notify the Contractor and the Architect if conditions are not acceptable for a successful installation. The General Contractor shall consult with the Tile Contractor and shall correct unacceptable conditions. In no case shall the owner be responsible for additional costs required for these corrections. In any case installation of tile shall be construed by the Architect as evidence of acceptance of substrate by tile contractor.

### PART II PRODUCTS



2.01 CERAMIC TILE:

- A Ceramic Tile shall be of the type and size scheduled on the drawings.
- B Containers shall be grade sealed.
- C Deliver all products to the building in manufacturer unopened containers with seals unbroken and label intact.

2.02 SETTING MATERIALS:

- A Latex-Portland Cement Mortar: ANSI A118.4, composed as follows:
  - 1. Mixture of Dry-Mortar Mix and Latex Additive: Mixture of prepackaged dry-mortar mix and liquid-latex additive complying with the following requirements:
    - a. Latex Additive: Styrene butadiene rubber.
    - b. For wall applications, provide non-sagging, latex-Portland cement mortar complying with ANSI A118.4 for mortar of this type defined in Section F-2.1.2.
- B Latex-Portland Cement Grout: ANSI A118.6 for materials described in Section H-2.4, composed as follows:
  - 1. Mixture of Dry-Grout Mix and Latex Additive: Mixture of factory-prepared, dry-grout mix and latex additive complying with the following requirements:
    - a. 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 (3.2 mm) and narrower.
    - b. 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 (3.2 mm) and wider.
    - c. Latex Additive: Styrene butadiene rubber.
- C Temporary Protective Coating: Provide product formulated to protect exposed surfaces of tile against adherence of mortar and grout which is compatible with tile and mortar/grout products, and is easily removable after grouting is completed without damaging grout or tile.
- D. Grout Sealer: Manufacturer's standard product for sealing grout joints that does not change color or appearance of grout.
  - 1. Acceptable Products:
    - a. Bonsal, W. R., Company; Grout Sealer.
    - b. Bostik; CeramaSeal Grout Sealer.
    - c. C-Cure; Penetrating Sealer 978.
    - d. Custom Building Products; Grout and Tile Sealer.
    - e. Jamo Inc.; Matte Finish Sealer.
    - f. MAPEI Corporation; KER 003, Silicone Spray Sealer for Cementitious Tile Grout.
    - g. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
    - h. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
    - i. TEC Specialty Products Inc.; TA-256 Penetrating Silicone Grout Sealer.

2.03 EXPANSION JOINTS:

- A Provide expansion joints in ceramic floor and wall tile not to exceed 24 feet on center. Where tile will be exposed to direct sunlight provide expansion joints not to exceed 16 feet on center. Always locate expansion joints over and in line with control joints in the slab below.
- B Expansion Joints shall be formed as follows:
1. Floor expansion joints shall be formed using prefabricated PVC joint filler with flange for grout interlock.
  2. Wall expansion joints shall be formed by leaving a 1/4 inch gap which shall be sealed using a backer rod and ASTM C920 Type S Grade NS Class 25 Use M and G Silicone sealant.
- 2.04 TRIM:
1. Floor to floor transition: Schluter RENO-TK, profile with sloped exposed surface, 1/4" deep channel below exposed surface, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer.
  2. Corners: Schluter DILEX-AHK, anodized aluminum profile with integrated trapezoid-perforated anchoring leg, connected at a 90 degree angle by a cove shaped section with a 3/8" radius that forms the visible surface.

### PART III EXECUTION

#### 3.01 LAYOUT:

- A Determine location of all movement joints prior to beginning work.
- B Layout all tile work so as to avoid cuts of less than one-half tile size.
- C Locate cuts so as to be the least conspicuous.
- D Align all wall joints to give straight uniform grout lines, plumb and level.
- E Align floor tile joints square with walls, and make them uniform in width.
- F Caulk expansion joints wherever tile butts a perpendicular surface.

#### 3.02 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANE INSTALLATION:

- A. Install waterproofing to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.
- B. Install crack-suppression membrane to comply with manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.
- C. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

#### 3.03 SETTING:

- A Setting shall conform to the recommendations of the Tile Council of America and the requirements of ANSI A108.5 and A108.10.
- B Joints in glazed wall tile shall be 5/16" wide. Lay out tile on walls so that so that no tile less than full size occurs.
- C Completed tile installation shall conform to the following tolerances:

1. Flatness of or wall: Variation not to exceed  $\frac{1}{4}$  inch in 10 feet non-accumulating from the required plane of the floor or wall.
2. Width of grout joint: (squareness) Variation of not more than  $\frac{1}{4}$  specified joint thickness over tile non-accumulating.

3.04 SEALING GROUT:

- A. Grout Sealer: Apply grout sealer to grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

3.05 INSTALLATION OF EXPANSION JOINTS:

- A Expansion joints in floor tile: Install movement profile in setting mortar directly over and aligned with joint in slab below. Take care to keep joint cavity in slab open and free of dirt and debris, mortar, grout, and setting materials. Set profile so that its upper surface will be  $\frac{1}{16}$  inch below the surface of the tile when installed. Face of tile should be set directly against face of expansion joint profile with no grout joint.
- B Expansion joints in wall tile: Align tile with joint in substrate (if one occurs) centering joint thickness over joint in substrate. Exercise caution during the installation of tile to keep joint in substrate open and free of dirt and debris, mortar, grout, and setting materials. Tile edges to which sealant will bond must be clean and dry. Sanding or grinding of these edges is recommended to obtain optimum sealant bond. Primer on these tile edges is mandatory when recommended by the sealant manufacturer. Care must be taken to keep primer off tile faces. Back-up strip shall be a flexible and compressible type of closed-cell form polyethylene, butyl rubber, or polyurethane, rounded at surface to contact sealant. It must fit neatly into the joint without compacting and to such a height to allow a sealant depth of  $\frac{1}{2}$  the width of the joint. Sealant must not adhere to the back-up material. Set compressible back-up strip when mortar is placed or utilize removable wood strip to provide space for back-up after mortar has cured. Install sealant after tile work and grout are dry. Follow sealant manufacturer's recommendations.

3.06 CLEANING AND PROTECTION:

- A After the work is completed, clean thoroughly, point up open joints and replace damaged tile.
- B Do not permit foot or wheel traffic on tile floors for at least 3 days. Cover all tile floors with heavy duty nonstaining building paper secured in place with masking tape as long as they are subject to construction traffic.

End of Section

## SECTION 09 65 19 – RESILIENT FLOORING AND BASE

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, equipment and supervision to provide and install vinyl flooring and rubber base in areas where indicated on the drawings and as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 PROJECT CONDITIONS:

- A Maintain 70° F. minimum temperature in room for 48 hours prior to installation, during installation, and 48 hours after installation. Maintain a minimum temperature of 55° F. thereafter.

#### 1.04 QUALITY ASSURANCE:

- A Comply with the provisions of the current editions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified.
  - 1. ASTM F – 1869 Test Method for Measuring Vapor Emission Rate of Concrete Subfloors Using Anhydrous Calcium Chloride.
- B Coordinate the requirements of floor adhesives and concrete finishing to assure compatibility between flooring adhesive and finish of concrete slab.
  - 1. Employ at Contractor's expense a testing laboratory to perform moisture testing on concrete slabs scheduled to receive resilient flooring at a rate of one test per 2000 sq.ft. prior to installation of finish flooring.
  - 2. Floors to receive resilient flooring shall limit moisture vapor emission to not more than 3 pounds per 1,000 sq.ft. per 24 hours, in compliance with RMA Moisture Test Unit.
- C Installation shall be by experienced and skilled mechanics, in accordance with the flooring manufacturer's latest printed instructions.
- D Coordinate the requirements of floor adhesives and concrete finishing to assure compatibility between flooring adhesive and finish of concrete slab.

#### 1.05 SUBMITTALS:

- A Submit product data, certificates, and maintenance data in accordance with Section 01300. Submit the following:
  - 1. Product data: For each type of product specified.
  - 2. Samples for Selection: In manufacturer's standard size for each pattern of floor covering specified, showing full range of variations expected in color and pattern.
  - 3. Maintenance Data: For sheet vinyl floor coverings to include in maintenance manuals specified in Division 1.

#### 1.06 GUARANTEE:

- A Furnish to the Architect a written guarantee that all work required by this section will be free from defects of materials and workmanship for a period of one year from date of acceptance of the work by the Architect.

## PART II PRODUCTS

### 2.01 MATERIALS:

- A Vinyl composition flooring shall be as indicated on the drawings.
1. If not indicated on drawings, "VCT"/"tile" shall be 12" x 12" x 1/8" Armstrong Standard Excelon Vinyl Composition Tile or equal by Mannington, Azrock, Shaw or Kentile. Pattern and color must be approved by Architect prior to bidding.
  2. If not indicated on drawings, "VCP"/"plank" shall be 48" x 4.5" Armstrong Luxury Vinyl Planks or equal by Mannington, Mohawk or Shaw. Pattern and color must be approved by Architect prior to bidding.
- B Cove Base shall be as indicated on the drawings.
1. If not indicated on drawings, provide thermoset vulcanized Rubber Base manufactured from 100% virgin synthetic rubber as manufactured by Johnsonite, Flexco Roppe, or alternate manufacturers approved by Architect prior to Bidding. Provide 1/8" gauge set-on straight base 4 inches high at carpeted floors. Provide 1/8" gauge set-on cove type, 4 inches high at all other floor surfaces where rubber base is indicated. Provide base in 120 foot rolls. Colors to be selected by the Architect.
- C Countoured Wall Base shall be Type TP, Group 1 thermoplastic rubber base as manufactured by Johnsonite, Flexco, Roppe, or approved substitute.
1. Basis of design: Johnsonite Millwork Wall Finishing System.
  2. Height, thickness and profile of base shall be as scheduled on the drawings.
  3. Provide base in 8 foot lengths.
  4. Provide mitered joints at corners and offsets. Provide scarf joints at running joints.
  5. Adhere mitered faces of base together with liquid latex contact adhesive similar and equal to Johnsonite 945 Contact Bond Adhesive.
- D Adhesive for installing resilient flooring shall be types specified by the flooring manufacturer. Adhesive for installing base shall be in accordance with manufacturer's written instructions.
- E Tapered edging strips for vinyl flooring termination shall be 1/8" thick by 1" wide, vinyl with tapered or rounded edge.
- F 1" feature strips shall be provided at changes in floor pattern.
- G Provide and install preformed base corners at all inside and outside corners.

## PART III EXECUTION

### 3.01 INSPECTION:

- A The Flooring Contractor shall inspect floor substrate to receive vinyl flooring prior to beginning work and shall bring any deficiencies, which would prevent him from producing an acceptable installation to the attention of the Architect and the General Contractor. He shall not proceed until the deficiencies are corrected. In no case shall the correction of deficiencies in the subfloor, required for successful installation, be cause for additional charges to the Owner. In any event, start of flooring work shall be construed by the Architect as acceptance by the Contractor, of the substrate for proper installation.

### 3.02 PREPARATION OF SURFACES:

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

- B. Concrete Substrates: Prepare according to ASTM F 710.
- C. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
- D. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- E. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- F. Moisture Testing: Perform tests specified or as recommended by the manufacturer if more stringent controls are required. Submit test results to Architect for review. Proceed with installation only after substrates pass testing.
- G. Scrub concrete subfloor with a rotary buffer with a 100 -150 grit abrasive screen over a 1" white nylon maintenance pad.
- H. Sweep or brush all surfaces clean of dust and foreign material and be sure that all surface irregularities have been corrected before resilient material is installed. Fill all voids to assure a smooth and solid anchorage of the flooring.

### 3.03 INSTALLATION:

- B Lay vinyl flooring so as to insure good contact, with close even joints and with all finished surfaces in a true plane, smooth, and with veining in tile/plank all laid in the same direction.
- C Joints shall be arranged as shown in the drawings.
  - 1. If not indicated on drawings, joints for any "VCT"/"tile" shall be laid continuous in both directions. Tiles shall be laid square with axis of room with widths of tiles at all sides as nearly even as possible, in no case less than 1/2 tile.
  - 2. If not indicated on drawings, joints for any "VCP"/"plank" shall be laid continuous on the long side of the planks and staggered in a randomly selected offset in an increment of 12" with no adjacent short joints aligning. Planks shall be laid square with axis of room with widths of planks on both "sides" of room/pattern as even as possible and in no case less than 1/2 a plank in the short dimension. Install with no less than 1/4 plank in the long dimension on both "ends" of room/pattern
- D It is intended that all sub-floors on which vinyl work is laid shall be smooth and level. The Contractor shall, however, provide approved "underlayment", recommended and guaranteed by flooring manufacturer for specific purpose, for filling small cracks and irregularities, as job conditions require.
- E Lay all vinyl flooring strictly as per manufacturer's printed specifications for particular material and type of tile and/or plank.
- F Install vinyl plastic edging strip with rounded or tapered edge where resilient floor terminates at points higher than contiguous finished flooring.
- G Install feature strips where floor pattern offsets.
- H Install rubber base around the base of all fixed base cabinets.
- I Install edge trim in accordance with manufacturer's directions.

### 3.03 CLEANING AND PROTECTION:

- J Perform the following operations immediately after installing resilient products:

1. Remove and replace all damaged, defective, scratched, and discolored tile and/or plank.
  2. Remove adhesive and other surface blemishes using cleaner recommended by the resilient product manufacturers.
  3. Sweep or vacuum floor thoroughly.
  4. Do not wash floor until after time period recommended by flooring manufacturer.
  5. Damp-mop floor to remove marks and soil.
  6. After time recommended by the manufacturer, apply protective floor polish to floor surfaces that are free from soil, visible adhesive, and surface blemishes. Coordinate selection of floor polish with Owner's maintenance service.
- K Cover installed flooring with undyed, untreated building paper until inspection for final completion.
- L Not more than 4 days before date scheduled for final inspection, clean flooring according to manufacturer's recommendations. Strip protective floor polish that was applied after completing installation only if required to restore polish finish and if recommended by flooring manufacturer. After cleaning, reapply polish to floor surfaces to restore protective floor finish and buff according to flooring manufacturer's written recommendations

End of Section

## SECTION 09 68 16 – CARPETING

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, transportation, etc., required to provide and install carpet, as shown on the drawings and specified.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBMITTALS:

- A Submit seaming diagram to Architect for approval prior to beginning work.
- B Submit data sheets and indicate quantities required on adhesive, seam cement, and other accessories.
- C Successful bidder, upon request of Architect, shall supply a complete color selection of samples of carpet on which he has based his bid.
- D Carpet to run in one direction extending wall to wall with no cross seams.

#### 1.04 QUALITY ASSURANCE:

- A Comply with the provisions of the current editions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified.
  - 1. ASTM F – 1869 Test Method for Measuring Vapor Emission Rate of Concrete Subfloors Using Anhydrous Calcium Chloride.
- B Coordinate the requirements of floor adhesives and concrete finishing to assure compatibility between flooring adhesive and finish of concrete slab.
  - 1. Employ at Contractor's expense a testing laboratory to perform moisture testing on concrete slabs scheduled to receive resilient flooring at a rate of one test per 2000 sq.ft. prior to installation of finish flooring.
  - 2. Floors to receive resilient flooring shall limit moisture vapor emission to not more than 3 pounds per 1,000 sq. ft. per 24 hours, in compliance with RMA Moisture Test Unit.
- C Installation of carpet to be by carpet workmen in a first-class workmanlike manner approved by the manufacturer so as to have adequate experience in commercial installation.
- D Carpet remnants, useable scrap, and overage to be packaged, identified and delivered to the Owner.
- E The Contractor shall quote in conformance with the exact specifications outlined. If, in addition, he desires to propose an alternate or a deviation, he shall provide a description of the alternate, a list of deviations and a quality sample of each proposed alternate at least ten (10) days prior to bid opening, accompanied by the product specifications and description on the carpet manufacturer's



letterhead and signed by an officer of the manufacturer's firm. If approved, an addendum covering approval will be issued prior to bid opening.

- F Installation shall be by experienced and skilled mechanics, who are certified by the floor covering manufacturer for heat-welded seam installation. All materials shall be installed in accordance with the flooring manufacturer's latest printed instructions.
- G Obtain each type, color, and pattern of carpet specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

1.05 PROJECT CONDITIONS:

- A Maintain 70° F minimum temperature in room for 48 hours prior to installation, during installation, and 48 hours after installation. Maintain a minimum temperature of 55° F thereafter.
- B Do not install carpets until they are at the same temperature as the space where they are to be installed.
- C Close spaces to traffic during carpet installation, and for a time period after installation recommended in writing by the manufacturer.
- D Install carpet and accessories after other finishing operations, including painting, have been completed.
- E Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive, as determined by floor covering manufacturer's recommended bond and moisture test.

1.06 GUARANTEE:

- H This Contractor shall guarantee in writing, in duplicate, that all work applied under this section shall be free from defective materials and workmanship for a period of one (1) year from the date of acceptance of this work. The Contractor shall, at his own expense, repair and replace any defective material or work.
- I Carpet shall have manufacturer's standard 10 year warranty.

PART II PRODUCTS

2.01 MATERIALS:

- A Materials shall be subject to normal carpet industry manufacturing tolerances of plus or minus 5 percent.
- B Carpet shall have a flame spread of 75 or less and shall have successfully passed the tunnel test (ASTM E-84), and it shall have a smoke density factor of less than 450.
- C Carpet:
  - 1. Furnish in widths of at least 12 feet and from same dye lot.
  - 2. Carpet Type shall be Mohawk Line Drive 25 oz carpet or as indicate on finish material schedule on the drawings.

2.02 ACCESSORIES:

- A Adhesive shall be waterproof cement as recommended by the manufacturer. Such recommendation must be in writing on the letterhead of the carpet manufacturer.
- B Seam cement shall be seam cement as approved by manufacturer.

PART III EXECUTION

3.01 INSPECTION:

- A The Flooring Contractor shall inspect floor substrate to receive carpet prior to beginning work and shall bring any deficiencies, which would prevent him from producing an acceptable installation to the attention of the Architect and the Contractor. **He shall not proceed until the deficiencies are corrected. In any event, start of carpet installation work shall be construed by the Architect as acceptance by the Contractor, of the substrate for proper installation. In no case shall correction of deficiencies in the floor substrate be cause for additional cost to the Owner.**
- B Verify that concrete slabs are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by floor covering manufacturer.

3.02 PREPARATION OF SURFACES:

- A Sweep or brush all surfaces clean of dust and foreign material and be sure that all surface irregularities have been corrected before resilient material is installed. Fill all voids to assure a smooth and solid anchorage of the tile.

3.03 INSTALLATION:

- A Inspection of floor surface to be covered shall be carefully done by the carpet contractor; and if not in proper condition to receive carpet, the fact shall be brought to the attention of the General Contractor, correction of defects will be made by the Contractor.
- B Three (3) copies of a printed installation manual written by the carpet manufacturer's Technical Service Department will be supplied to the Architect before acceptance of material.
- C The subcontractor shall be held responsible for the accuracy of measurement and fit of this work.
- D The work specified herein shall be done by skilled workmen fully experienced in this type of work.
- E Floor areas to receive carpet shall be smooth, broom clean, and dry prior to installation of carpeting.
- F Carpeting shall be secured to floor with waterproof adhesive per manufacturer's recommendations.
- G Carpet shall be installed, wall to wall, using continuous lengths and as broad widths as possible to minimize the placement of seams in traffic lanes. Cut edges shall be trued and appropriately treated to form invisible and non-raveling joints where exposed.
- H Carpet shall be installed in accordance with manufacturer's recommendations for seaming technique and seaming cement.

- I Metal binder bars shall be installed at all areas where floor covering material changes, or at carpet edges that do not abut a vertical surface.
- J Installed carpet shall be free of spots, dirt or soil, and shall be without tears, frayed or pulled tufts.
- K This Contractor shall apply appropriate covering over carpeted areas until final acceptance if requested by Owner. Upon acceptance of this work by the Owner, this Contractor shall remove all debris and the protective coverings from the site and dispose of them in a legal manner.
- L Two (2) copies of a printed maintenance manual written by the carpet manufacturer's Technical Service Department will be delivered by the Contractor to the Owner at the job site.

3.04 MANUFACTURER'S TECHNICAL SERVICE:

- A Manufacturer of carpet used shall provide, at the commencement of installation and at any time during the project as needed, a technical advisor employed by the manufacturer to insure the carpet is installed to meet these and manufacturer's specifications. Contractor shall coordinate visit of technical advisor with the commencement of carpet installation and shall notify the Architect in writing not less than two (2) weeks in advance of the date and time of this visit.

3.05 CLEANING:

- A Clean all carpet at completion of installation, removing all foreign substances.

End of Section

## SECTION 09 91 00 - PAINTING

### PART I GENERAL

#### 1.01 SCOPE:

- A. Painting is required on all new and existing surfaces unless otherwise scheduled and/or as noted on the drawings and herein as specified.
- B. The term "paint" as used herein is all inclusive, meaning emulsions, enamels, oil paints, sealers, stains, varnishes, polyvinyl emulsions, latex emulsions and similar coatings.
- C. Before any paint material has been delivered to the job, submit a complete list of materials proposed for use, identifying each type of material by manufacturer's brand name, and no material shall be delivered to the job until the Architect's approval has been secured in writing. Approval will be of brands and quality, but not for results obtained.
- D. Painting will not be required on non-ferrous metal, putty, or glazing compound, masonry with integral color, or on factory finished items including prefinished cabinet work, equipment and galvanized wirework, except as may be specifically required elsewhere in the specifications.
- E. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- F. Conditions of Surfaces: It shall be the responsibility of each subcontractor to carefully inspect and examine surfaces or areas prepared to receive his work. Should he consider such surfaces or areas not proper or satisfactory for the installation or application of his work, he shall notify the Contractor in writing with copy to the Architect. Should he proceed before proper corrections have been made, it shall be at his own risk and any subsequent corrections that may be ordered or required shall be at his expense.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.
- B. See Section 092900 Gypsum Wallboard for finish requirements for
  - 1. Semi gloss and gloss paint finishes.
  - 2. Prime coat on Paperless Gyp. Bd.

#### 1.03 DEFINITIONS:

- A. Flat refers to a lusterless or matt finish with a gloss range below 15 when measured at an 85-degree meter.
- B. Eggshell refers to low-sheen finish with a gloss range between 5 and 20 when measured at a 60-degree meter.
- C. Semi gloss refers to a medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.
- D. Full gloss refers to a high-sheen finish with a gloss range more than 65 when measured at a 60-degree meter.

#### 1.04 SUBMITTALS:

- A. Submit manufacturer's data including label analysis and instructions for handling, storing, and applying each material proposed for use. Include block fillers and primers.
- B. Provide certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- C. Where substitutions are approved, submit samples for color selection in the form of manufacturer's color charts.

- D. Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate if required by the Architect.

1.05 QUALITY ASSURANCE:

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.
- B. Obtain primers, block fillers and undercoat paint for each system from same manuf. as finish coats.
- C. Provide primers compatible with finish system in strict accordance with manufacturer's recommendations. Upon request, furnish data for characteristics of finish materials to ensure compatible prime coats are used.
- D. Notify the Architect of problems anticipated using the materials specified.
- E. Provide the manufacturer's best quality paint material for each coating type specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
- F. Proprietary names used to designate colors or materials are not intended to imply that products named are required, or to exclude equal products of other manufacturers.
- G. No claim by the Contractor concerning the unsuitability of any material specified or his inability to produce satisfactory results therewith will be considered unless such claim is made in writing to the Architect before the Contract is signed.
- H. The Architect will select one room or surface to represent surfaces and condition for each type of coating and substrate to be painted, demonstrating finished colors textures. Final acceptance of colors will be given based on job-applied samples. After finishes are accepted, the Architect will use the room or surface to evaluate coating systems of a similar nature.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
  - 1. Product name or title of material.
  - 2. Product description (generic classification or binder type).
  - 3. Manufacturer's stock number and date of manufacture.
  - 4. Contents by volume, for pigment and vehicle constituents.
  - 5. Thinning instructions.
  - 6. Application instructions.
  - 7. Color name and number.
  - 8. VOC content.
- B. Store materials not in use in tightly covered containers in a well ventilated area at a minimum ambient temperature of 45° F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
- C. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.07 EXTRA MATERIALS:

- A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory- sealed containers for storage and identify with labels describing contents. Deliver extra materials to owner at close of Project.
- B. Furnish Owner with additional 5 percent, but not less than 1 gal of each material & color applied.

1.08 JOB CONDITIONS:

- A. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are 50° F -90° F.
- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are 45° F -95° F.
- C. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, at temperatures less than 5° F (3° C) above the dewpoint, or to damp or wet surfaces.
- D. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

## PART II PRODUCTS

### 2.01 MANUFACTURERS:

- A. Products: Subject to compliance with requirements, provide one of the products in the paint schedules.
- B. Manufacturer's Names: The following manufacturers are referred to in the paint schedules by use of shortened versions of their names, which are shown in parentheses:
  - 1. ICI Paint Stores/Glidden Professional (ICI).
  - 2. PPG Industries, Inc. (PPG).
  - 3. Sherwin Williams (SW).
  - 4. Comex Group (CW).

### 2.02 PAINT:

- A. Paint shall be ready-mixed, except that tinting and thinning may be done at the job. The paint shall be suitable for spraying when thinned by not more than 12 percent by volume of thinner. All paint materials shall be delivered in original unopened containers with labels intact and legible.
- B. Provide block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- C. Provide manufacturer's best-quality paint material of the various coating types specified. Paint- material containers not displaying manufacturer's product identification will not be acceptable.
- D. Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- E. Colors: Match colors indicated by reference to manufacturer's color designations.

### 2.03 COLORS AND SPECIMENS FOR APPROVAL:

- A. Colors and finishes shall be as selected by the Architect. Before any work is done, the Architect will furnish the Contractor with a set of color cards and a schedule showing where the various colors shall go. The Contractor shall then prepare samples at the job as required until the colors and textures are satisfactory. Wood used to display stains shall be the same kind on which the stain is to be used.
- B. The Contractor, if requested by the Architect, shall finish one complete room, space, or item, for each color scheme or finish required, showing selected colors, finished texture, materials and workmanship. After approval, these sample rooms or items shall serve as standard for similar work throughout the building.

## PART III EXECUTION

### 3.01 EXAMINATION:

- A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.
- B. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
- C. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

3.02 GENERAL REQUIREMENTS:

- A. Maintain temperature of rooms where varnish or enamel is being applied at 70 degrees or more, and at 50 degrees or more during other interior painting. Do exterior painting only when temperature is 50 degrees or higher, and in dry weather.
- B. Apply all materials under adequate illumination, evenly spread and smoothly flowed on without runs or sags. Only skilled workmen shall be employed.
- C. Vary tints of succeeding coats slightly to permit identification of coats.
- D. If any paint is applied to damp material or improperly prepared surfaces; the Contractor shall use such corrective measures as determined by the Architect.
- E. Protect all adjacent work and materials by suitable covering, or other methods, during progress of the work. Upon completion, remove all paint spots from floors, glass and other surfaces.
- F. Store and mix paint materials only in spaces designated and assigned for the purpose. Do not permit paint or oil soaked rags or waste to accumulate. Exercise strict precautions at all times against fire.
- G. Side edges of wood doors shall be finished same as faces. Top and bottom edges shall have adequate sealer coatings applied immediately after fittings.
- H. Covering shall be complete. When color, stain, dirt, or undercoats show through the final coat of paint, apply additional coats until the finish is of uniform color and appearance and coverage is complete.
- I. Paste wood filler, when set, shall be wiped across the grain, then with the grain, to secure a clean surface.
- J. Enamel, varnish, or oil finish applied to wood or metal shall be sanded between coats with fine sandpaper to produce an even, smooth finish.
- K. Before painting, remove hardware, accessories, plates, lighting fixtures and similar items, or provide ample protection for such items. Upon completion of each space, replace above items. Remove doors, if necessary, to paint bottom edge. Use only skilled workmen for removing and connecting above items.
- L. Paint all new exterior wood.
- M. Paint all interior wood.
- N. Paint all new metal structure exposed in interior of building.
- O. When painting existing surfaces or new work cut into existing surfaces, new paint coverage shall extend corner to corner and floor to ceiling covering the entire plane of the surface in question.

3.03 PREPARATION OF SURFACES:

- A. Wood surfaces shall be sandpapered to a smooth and even surface and dusted off. After priming or stain coat has been applied, thoroughly fill nail or other holes and cracks with plastic wood or putty; for natural finish work, filler (if required) shall be colored to match wood.

- B. On metal surfaces, remove grease, rust, scale and dust, and touch up any abraded place on items that have been shop coated. Where steel or iron has a heavy coating of scale, it shall be removed by wire-brushing or sandblasting as necessary to produce satisfactory painting surface.
- C. Chemically treat galvanized metal surfaces with a compound for this purpose, in accordance with the manufacturer's directions for use, before applying the first coat of paint.
- D. Concrete block surfaces: Wire brush to remove loose materials.
- E. Exposed concrete: Wire brush to remove loose mortar. Patch and repair surfaces for uniform texture.
- F. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
- G. Backpriming: All concealed surfaces of painted wood shall be backprimed. Spot prime all ends of trim.
- H. Touch up bare areas of shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.
- I. Clean galvanized surfaces with non-petroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- J. On previously painted surfaces, all loose, powdery or peeling paint, wax, grease, and other foreign matter shall be removed prior to application of new paint. Cracks and other surface imperfections shall be repaired. Glossy surfaces shall be dulled by sanding and then wiped clean with a damp cloth. Rinse surfaces thoroughly to remove all detergent residues.
- K. Between coats of polyurethane prime coat rub with steel wool and allow overnight drying.

#### 3.04 PROTECTION:

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by the Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
- C. At completion of construction activities of other trades, touch and restore damaged or defaced painted surfaces.

#### 3.05 CLEANING:

- A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
- B. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

#### 3.06 SCHEDULE OF PAINTING:

##### GENERAL:

- 1. All items listed in the following paint schedule may not apply to this project.
- 2. Numbers of coats listed in this schedule are minimum. If coverage is not complete and uniform, additional coats must be added until the finished surface is satisfactory and accepted by the Architect.
- 3. Omit primer on metal surfaces that have been shop primed and touch-up painted.
- 4. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.



5. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.
6. Where graphics are shown on the drawings they shall be applied in two (2) coats of Latex Enamel with two (2) coats of clear acrylic applied over finished graphics. Graphics shall be applied by an approved professional sign painter.
7. Electric Panel Boxes: Two (2) coats Rustoleum over prime coat.
8. Exposed Pipe, Pipe Hangers, Sprinkler Pipe, Sprinkler Pipe Hangers, Supports etc.: Two (2) coats satin enamel over metal primer.
9. Exposed Ductwork: Two (2) coats satin enamel over one (1) coat metal primer for galvanized.
10. Wood Doors Not Factory Finished: Stain followed by one (1) coat sealer primed followed by two (2) coats satin-clear varnish.
11. Specific finishes listed in the finish schedule on the drawings take precedence over the finishes listed below.

**B. EXTERIOR:**

1. Metal: Provide the following finish system over miscellaneous ferrous metal, structural, hollow metal doors and frames, louvers:

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a rust-inhibitive primer:

Primer: Rust-inhibitive metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.3 mils:

ICI: 4020 Devflex DTM Flat Int./Ext. Waterborne Primer/Finish.

PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.

SW: DTM Acrylic Primer/Finish, B66W1 (OR) Kem Kromik Universal Metal Primer, B50Z (Alkyd).

CW: C309 Ultra Teach DTM Universal Water-Based Metal Primer

First and Second Coats: Semi gloss, exterior, acrylic-latex enamel applied at spreading rate recommended by manuf. to achieve total dry film thickness of not less than 2.6 mils.

ICI: 2406 Decrashield Semi gloss Finish.

PPG: 78 Line Sun-Proof Semi-Gloss House and Trim Paint.

SW: A100 Exterior Acrylic Gloss A8 Series or Metalatex Exterior Semi-gloss Coating, B42-100.

CW: C218 Ultra Tech Exterior 100% Acrylic Semi-Gloss Coating

2. Non-Ferrous Metal: Galvanized. (Acid etch galvanized surfaces that have not weathered at least six months prior to beginning painting operations). Provide the following finish systems over exterior zinc-coated (galvanized) metal surfaces:

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a galvanized metal primer.

Primer: Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.

ICI: 4020 Devflex DTM; Flat Int./Ext. Waterborne Primer /Finish.

PPG: 90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM Industrial Enamel.

SW: DTM Acrylic Primer/Finish, B66W1.

CW: C309 Ultra Teach DTM Universal Water-Based Metal Primer

First and Second Coats: Semi gloss, exterior, acrylic-latex enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.6 mils.

ICI: 2406 Decrashield Semi gloss Finish.

PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.

SW: A100 Exterior Acrylic Gloss A8 Series (OR) Metalatex Exterior Semi-gloss Coating, B42-100.  
CW: C218 Ultra Tech Exterior 100% Acrylic Semi-Gloss Coating

3. Aluminum surfaces in contact with masonry or steel to have a coat of zinc chromate.
4. Smooth Wood and PVC pipe columns: Provide the following finish systems over smooth wood siding and other smooth, exterior wood surfaces:

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a primer.  
Primer: Exterior, alkyd or latex wood primer, as recommended by the manufacturer for this substrate, applied at a spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.5 mils.

ICI: 2000 Decrashield Primer.  
PPG: 72-1 Sun-Proof Exterior House & Trim Wood Primer-Flat Latex.  
SW: (Wood) A100 Exterior Latex Primer, B42W41; (PVC) PrepRite Bonding Primer, B51W50.  
CW: 330 Optima All Prime Acrylic

First and Second Coats: Semi gloss, waterborne, exterior, acrylic enamel applied at a spreading rate recommended by the manuf. to achieve a total dry film thickness of not less than 2.4 mils.

ICI: 2406 Decrashield Semi gloss Finish  
PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.  
SW: A100 Exterior Acrylic Gloss A8 Series (OR) Metalatex Exterior Semi-gloss Coating, B42-100.  
CW: C218 Ultra Tech Exterior 100% Acrylic Semi-Gloss

5. GFRC fabrications, Fiber-cement Siding and Trim: Provide the following finish systems over fiber-cement siding and trim surfaces:

Semi-Gloss, Acrylic-Enamel Finish: Two (2) finish coats over a primer.

Primer: Exterior, Alkali Resistant 100% Acrylic primer, as recommended by manufacturer for this substrate, applied at a spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2 mils.

ICI: 3210-1200 Interior/Exterior Alkali Resistant Primer - Non Flat Acrylic .  
PPG: 4-603 Interior/Exterior Alkali Resistant Primer-Non Flat Acrylic.  
SW: Loxon Exterior Alkali-Resistant Primer – Flat Acrylic  
CW: 335 Tropiccoat Masonry Alkali-Resistant Primer

First and Second Coats: Semi gloss, waterborne, exterior, acrylic enamel applied at a spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.4 mils.

ICI: 2406 Decrashield Semi gloss Finish  
PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.  
SW: A100 Exterior Acrylic Gloss A8 Series (OR) Metalatex Exterior Semi-gloss Coating, B42-100.  
CW: C218 Ultra Tech Exterior 100% Acrylic Semi-Gloss

6. Concrete Block: Provide the following finish over exterior concrete masonry units:

Flat Smooth Elastomeric Coating: Two (2) finish coats over block filler.

Block Filler: High-performance, latex block filler applied a spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 9.0 mils.

ICI: 4000 Bloxfil latex Interior/Exterior Block Filler.  
PPG: 4-100 Pittblock LTC Acrylic Block Filler.  
SW: Heavy Duty Block Filler, B42W46 or Loxon Block Surfacer A24W2W.  
CW: 3250 Hi-Build Block Filler (OR) 1240 Flex Lox High Build

First and Second Coats: Flat, exterior, Smooth Elastomeric Coating applied at spreading rate recommended by manufacturer to achieve total dry film thickness of less than 12 mils.

ICI: 2260 Decra Flex Elastomeric Coating System.  
PPG: 4-110 Acrylic Elastomeric Paint.  
SW: Conflex XL HB Smooth Elastomeric Coating, A5 Series.  
CW: 1240 FlexLox High Build Exterior coating (OR) 1270 FlexLox Satin High Build

Exterior Coating: Finish coat should be applied with an airless sprayer and backrolled with a medium napp roller to eliminate pin holes.

7. Concrete, Stucco, and Masonry (Other than Concrete Masonry Units):

Flat Acrylic Finish: Two (2) finish coats over a primer.

Primer: Alkali-resistant, exterior, acrylic-latex primer applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 1.5 mils.

ICI: 2000 Decrashield Acrylic Primer.  
PPG: 6-603 Speedhide Interior/Exterior Acrylic Latex Alkali Resistant Primer.  
SW: Loxon Exterior Acrylic Masonry Primer, A24-300.  
CW: 335 Tropiccoat Masonry Alkali-Resistant Primer (OR) 1240 Flex Lox High Build Coating Alkali-Resistant

First and Second Coats: Flat, exterior, acrylic-emulsion paint applied at a spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.4 mils.

ICI: 2200 Decrashield Flat Finish.  
PPG: 10 Line Pitt-Cryl Exterior Water Base Paint.  
SW: A100 Exterior Latex Flat House Paint, A6 Series.  
CW: C214 UltraTech Exterior 100% Acrylic Flat

C. INTERIOR:

1. Concrete and Masonry walls (Other than Concrete Masonry Units): Provide the following paint systems over interior concrete and brick masonry surfaces.

Flat Acrylic Finish: Two (2) finish coats over a primer. (Omit primer on previously painted surfaces.)

Primer: Alkali-resistant, acrylic-latex, interior primer applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than 1.0 mil.

ICI: 1030 Ultra-Hide PVA Interior Primer Sealer.  
PPG: 6-2 Speedhide Interior Quick –Drying Latex Sealer.  
SW: PrepRite 200 Interior Latex Wall Primer, B28W200.  
CW: Ultra Tech C152 Interior Latex Primer-Sealer

First and Second Coats: Flat, latex-based, interior paint applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.5 mils.

ICI: 1210 Ultra-Hide Latex Flat Wall Paint.  
PPG: 90 Line Wallhide Interior Wall Flat Latex Paint.  
SW: ProMar 400 Latex Flat Wall Paint, B30W400.  
CW: Ultra Tech C115 Interior Latex Flat

2. Concrete floors: Provide the following finish systems over interior concrete floors. Verify compatibility with curing and sealing agents prior to applying.

Satin, Acrylic-Enamel Finish: Two (2) finish coats over primer.

Primer: Alkali-resistant, waterborne acrylic-latex alkali resistant primer applied at spreading rate recommended by manuf. to achieve total dry film thickness of not less than 1.0 mil.

ICI: 3210 Acrylic alkali-resistant primer.  
PPG: 6-603 Acrylic latex alkali resistant primer.  
SW: ArmorSeal Tread-Plex Primer, B90 Series.  
CW: Ultra Crete 3980 Acrylic Deck Coating

First and Second Coats: Satin waterborne DTM acrylic enamel paint applied at spreading rate recommended by manuf. to achieve total dry film thickness of not less than 2.5 mils.

ICI: 4218 Satin acrylic DTM waterborne enamel.

PPG: 90-474 Satin acrylic DTM waterborne enamel.

SW: ArmorSeal Tread-Plex WB Acrylic Semi-gloss Floor Coating, B90 Series

CW: Ultra Crete 3980 Acrylic Deck Coating

3. Concrete Masonry Units: provide the following finish systems over interior concrete masonry block units:

Low-Luster, Acrylic-Enamel Finish: Two (2) finish coats over a block filler.

Block Filler: High-performance, latex-based, block filler applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 5.0 mils.

ICI: 3010 Ultra-Hide Latex Interior/Exterior Block Filler.

PPG: 6-7 Speedhide Interior/Exterior Masonry Latex Block Filler.

SW: Preprite Block Filler, B25W25.

CW: 3250 Hi-Build Block Filler

First and Second Coats: Low-Luster (eggshell or stain), acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.8 mils.

ICI: 1412 Ultra-Hide Latex Eggshell Wall & Trim Enamel.

PPG: 88-110 Satinhide Interior Enamel Wall & Trim LO-Lustre Semi-Gloss Latex.

SW: ProMar 200 Latex Eg-Shel Enamel, B20W2200 Series.

CW: UltraTech C106 Interior Eggshell Enamel

4. Epoxy Painted Concrete Masonry Units: provide the following finish systems over interior concrete masonry block units:

Semi-gloss Polyamid Epoxy Finish: Two (2) finish coats over a block filler.

Block Filler: Heavy Duty Acrylic block filler applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 12mils.

ICI: 4000 Blox-Fill Interior Exterior Heavy Duty Acrylic Block filler

PPG: 16-90 Pit-Glaze Heavy Duty Acrylic Block filler

SW: Heavy Duty Block Filler, B42W46.

CW: 3250 Hi-Build Block Filler

First and Second Coats: Semi-Gloss Polyamide Epoxy applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than 5 mils.

ICI: 4406 Tru-Glaze Water Borne Semi-Gloss Coating.

PPG: 97 Line Aquapon Polyamide Epoxy Semi-Gloss Coating.

SW: Tile Clad H.S. Epoxy, B62Z-100 Series (Eg-Shel) or B70-200 Semi-gloss.

CW: 1300 Clean Coat Aqua Epoxy

5. Gypsum Board: provide the following finish systems over interior gypsum board surfaces:

Flat Acrylic Finish: Two (2) finish coats over a primer. (Walls scheduled to receive wall fabric shall receive one coat of Latex Primer – Tint Primer to match wall fabric).

Primer: Latex – based, interior primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.

ICI: 1030 Ultra-Hide PVA Interior primer Sealer.

PPG: 17-10 Quick-Drying Interior Latex Primer-Sealer.

SW: PrepRite 200 Latex Wall Primer, B28W200.

CW: UltraTech C152 Interior Latex Primer-Sealer

First and Second Coats: Flat, acrylic-latex based, interior paint applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.5 mils.

ICI: 1210 ultra-Hide Latex Flat Wall Paint.

PPG: 80 Line Wallhide Interior Wall Flat Latex Paint.  
SW: ProMar 400 Latex Flat Wall Paint, B30W400.  
CW: UltraTech C115 Interior Latex Flat

6. Painted Interior Wood Surfaces: Provide the following paint finish systems over new, interior wood surfaces.

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a wood undercoater. (Omit undercoater on previously painted surfaces.

Undercoat: Alkyd – or acrylic-latex based, interior wood undercoater, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.

ICI: 1020 Ultra-Hide Latex Interior Wood Undercoater.  
PPG: 6-755 Speedhide Interior Water-Based Undercoater.  
SW: PrepRite ProBlock Latex Primer/Sealer, B51W20.  
CW: Ultra Tech C152 Interior Latex Primer-Sealer

First and Second Coats: Semi gloss, acrylic-latex, interior enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.6 mils.

ICI: 1416 Ultra-Hide Latex Semi-Gloss Wall and Trim Enamel.  
PPG: 88-110 Satinhide Interior Enamel Wall and Trim Lo-Lustre Semi-Gloss Latex.  
SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.  
CW: UltraTech C119 Interior Latex Semi-Gloss Enamel

7. Stained Woodwork: Provide the following stained finish over new, interior woodwork :

Waterborne, Satin-Varnish Finish: Two (2) finish coats of a waterborne, clear-satin varnish over a sealer coat and a waterborne, interior wood stain.

Stain Coat: Waterborne, interior wood stain applied at spreading rate recommended by manuf.

ICI: 41XX WoodWorks Waterborne Interior stain. (ICI-Devoe)  
PPG: 77-302 Rez Interior Semi-Transparent Stain.  
SW: Wood Classic Interior Oil Stain, A49-200.  
CW: UltraTech C365 Semi-Transparent Wood Stain

Sealer Coat: Clear sanding sealer applied at spreading rate recommended by manuf.

ICI: 4200 WoodWorks Waterborne Quick-Dry Clear Sealer. (ICI-Devoe)  
PPG: 77-30 Rez Interior Quick-Drying Sealer and Finish.  
SW: Wood Classic Fast Dry Sanding Sealer, B26V43.  
CW: 901 Var-Prep

First and Second Finish Coats: Waterborne varnish finish applied at spreading rate recommended by manufacturer.

ICI: 4300 WoodWorks Waterborne Crystal Clear Finish, Satin. (ICI-Devoe)  
PPG: 77-49 Rez Satin Acrylic Clear Polyurethane.  
SW: Wood Classic Water Borne Polyurethane Varnish A68 Series.  
CW: UltraTech C167 Interior Polyurethane Satin Varnish

8. Painted Ferrous Metal (Hollow Metal doors and frames, electrical panel boxes etc.): Provide the following finish over interior metal work.

Semi gloss Acrylic-Enamel Finish: One finish coat over an enamel undercoater and a primer. (Omit primer on shop primed items)

Primer: Quick-drying rust-inhibitive, alkyd-based or epoxy-metal primer, as recommended by manufacturer for this substrate, applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than 1.5 mils.

ICI: 4160 Devguard Multi-purpose Tank and Structural Primer.  
PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.  
SW: Kem Kromik Universal Metal Primer, B50Z Series.

CW: UltraTech C305 Alkyd Rust Inhibitive Primer

Undercoater: Alkyd, interior enamel undercoat or semi gloss, acrylic-latex, interior enamel as recommended by the manufacturer for this substrate, applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 1.3 mils.

ICI: 1516 Ultra-Hide Alkyd Semi-Gloss Interior Wall and Trim Enamel.

PPG: 6-6 Speedhide Interior Quick-Drying Enamel Undercoater.

SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.

CW: UltraTech C119 Interior Latex Semi-Gloss Enamel

Finish Coat: Semi gloss, acrylic-latex, interior enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 1.3 mils.

ICI: 1516 Ultra-Hide Alkyd Semi-Gloss Interior Wall and Trim Enamel.

PPG: 88-110 Satinhide Interior Enamel Wall and Trim Lo-Lustre Semi-Gloss Latex.

SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.

CW: UltraTech C119 Interior Latex Semi-Gloss Enamel

9. Non-Ferrous Metal: Galvanized. Provide the following finish systems over exterior zinc-coated (galvanized) metal surfaces:

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a galvanized metal primer.

Primer: Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.

ICI: 4020 Devflex DTM ;Flat Int./Ext. Waterborne Primer /Finish.

PPG: 90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM Industrial Enamel.

SW: DTM Acrylic Primer/Finish, B66W1.

CW: UltraTech C309 Universal Water-Based Metal Primer

First and Second Coats: Semi gloss, acrylic-latex enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.6 mils.

ICI: 2406 Decrashield Semi gloss Finish.

PPG: 88-110 Satinhide Interior Enamel Wall and Trim Lo-Lustre Semi-Gloss Latex.

SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.

CW: UltraTech C119 Interior Latex Semi-Gloss Enamel

10. Metal Decking, Bar Joists, exposed metal structure (non-galvanized): Provide the following finish systems over shop primed metal surfaces:

Flat Waterborne Acrylic Dry Fall Finish: Two (2) coats applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of 4 mils.

ICI: 1280 Spraymaster Pro – Waterborne Flat Acrylic Dryfall.

PPG: Speedhide Latex dry Fog Flat Spray Paint, 6-715

SW: Waterborne Acrylic Dryfall, Flat, B42W1

CW: UltraTech C157 Interior Latex Flat Dryfall

CW: UltraTech C309 Universal Water-Based Metal Primer

CW: UltraTech C119 Interior Latex Semi-Gloss

11. Aluminum surfaces in contact with masonry or steel to have a coat of zinc chromate.

### 3.07 MECHANICAL AND ELECTRICAL ITEMS:

- A. All equipment such as pumps, tanks, air units, compressors, cabinets, etc., that have had their paint defaced, scarred or skinned shall be touched up with machinery enamel.

ICI: 4318 Speedenamel Q. D. Gloss Enamel.

PPG: Lavax Machinery Enamel, 23- Line.

SW: Steel Spec Fast Dry Alkyd Enamel, B55W811.

CW: UltraTech C248 Exterior Alkyd Semi-Gloss Enamel

- B. All uncovered pipe hangers, tank stands, equipment support stands and brackets, uncovered portions of tank, and other mechanical apparatus, including factory finished items, shall be painted as scheduled above for painted ferrous metal.
- C. All hot water, cold water, steam, condensation, circulating water lines for heating and cooling, drains gas piping, electrical conduit, junction boxes and similar items exposed shall be painted as scheduled above for painted ferrous metal, galvanized metal or Aluminum Metal-lite, as appropriate for the substitute.
- D. All electrical panel boxes, box covers, conduit junction boxes, brackets and accessories except those in electrical rooms shall have field finish paint, as scheduled above for ferrous metal over prime finish, or factory finish.
- E. Exposed Ductwork: As scheduled above for galvanized metal. Interior of ducts exposed to view shall be painted flat black for the first two (2) feet beyond grill or diffuser.

End of Section

## SECTION 10 14 00 - SIGNAGE

### PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all materials, labor, equipment, and supervision necessary to provide and install signage as shown on the drawings and specified herein.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 WARRANTY:

- A. Provide manufacturers standard warranty.

### PART II PRODUCTS

#### 2.01 MANUFACTURERS:

- A. Manufacturer shall be Vomar Products, Inc., ASI Sign System or ANDCO Industries Corp.

#### 2.02 MATERIALS:

- A. Interior Door Signage:

1. Provide and install molded plastic 8" x 8" model 390's signs as manufactured by ASI.
2. Signs shall read as indicated below: Each shall have a graphic men or women symbol or both. The international symbol of accessibility, raised lettering and Grade 2 Braille as required by the Americans with Disabilities Act.

#### **Schedule of door signs:**

All public toilets shall have one sign per door. Coordinate with Owner or Architect for male, female or unisex designations.

Provide one building identification sign per building.

Provide individual signs with Braille and raised lettering for all unit doors and for all common area doors to be mounted as indicated on the drawings and as required by ANSI and the 2009 NCBC Section 1109.5.

All rooms to which the general public has access as required by ANSI regulations shall have a sign. Coordinate with Owner or Architect for Room Names and/or Numbers.

Other signs shall be as noted on the drawings.

- B. Interior Handicapped Exit Signs:

1. Provide and install molded Acrylic 4" x 4" EmBoss™ ADA-Ready™ sign system with radiused corners at interior of each door as indicated on the drawings.
  - a. Mounting Panel: Acrylic
  - b. Face: Vacuum formed 1.5 mil. Clear, scratch resistant PVC/vinyl acetate bonded to acrylic mounting panel.



- c. Mounting Panel: .080 inch thick matte finished acrylic in color as selected by the Architect from manufacturer's full range.
- d. Tactile lettering and graphics as selected by the Architect from Manufacturer's standard options.
  - i. Text: Exit.
  - ii. Provide Grade 2 Braille as required by the Americans with Disabilities Act.
- e. Installation Method: System VT, vinyl tape.

### PART III EXECUTION

#### 3.01 INSTALLATION:

- A. Locate signs where indicated on the drawings.
- B. Install in accordance with manufacturers recommendations.

End of Section

## SECTION 10 21 16 - SOLID PLASTIC TOILET COMPARTMENTS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Furnish all labor, material, equipment, and supervision to provide and install floor mounted, overhead braced, solid plastic toilet compartments and screens as indicated in drawings and specified herein.

#### 1.02 RELATED DOCUMENTS

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 REFERENCES

- A. ASTM International (ASTM):
  - 1. A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - 2. B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 3. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. National Fire Protection Association (NFPA) 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

#### 1.04 SUBMITTALS

- A. Submittals for Review:
  - 1. Shop Drawings: Include dimensioned layout, elevations, trim, closures, and accessories.
  - 2. Product Data: Manufacturer's descriptive data for panels, hardware, and accessories.
  - 3. Samples: 2 x 3 inch samples in each color.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 10 years experience in manufacture of solid plastic toilet compartments with products in satisfactory use under similar service conditions.
- B. Installer Qualifications: Minimum 5 years experience in work of this Section.

#### 1.06 WARRANTIES

- A. Provide manufacturer's 25 year warranty against breakage, corrosion, and delamination under normal conditions.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Contract Documents are based on Floor Mounted Overhead Braced Hiny Hiders by Scranton Products.
- B. Additional alternate manufacturers pre-approved to provide product equal to or exceeding specified

requirements are Accutec Mfg., Bradley Corp. and Hadrian Inc. Color and texture must be approved by Architect as meeting aesthetic intent prior to bidding or are subject to rejection.

## 2.02 MATERIALS

### A. Doors, Panels and Pilasters:

1. High density polyethylene (HDPE), fabricated from polymer resins compounded under high pressure, forming single thickness panel.
2. Waterproof and nonabsorbent, with self-lubricating surface, resistant to marks by pens, pencils, markers and other writing instruments.
3. 1 inch thick with edges rounded to 1/4 inch radius.
4. Fire hazard classification: Class A flame spread/smoke developed rating, per ASTM E84.
5. Color/Texture: As indicated on drawings

### B. Aluminum Extrusions: ASTM B221, 6463-T5 alloy and temper.

### C. Stainless Steel: ASTM A167, Type 304.

## 2.03 HARDWARE

### A. Hinges: Regal hinge fabricated from heavy-duty cast aluminum, wrap around flanges, adjustable on 30-degree increments, through bolted to doors and pilasters.

### B. Door Strike and Keeper:

1. 6 inches long, fabricate from heavy-duty extruded aluminum with bright dip anodized finish, with wrap-around flanges secured to pilasters with stainless steel tamper resistant Torx head sex bolts.
2. Bumper: Extruded black vinyl.

### C. Latch and Housing:

1. Heavy-duty extruded aluminum.
2. Latch housing: Bright dip anodized finish.
3. Slide latch and paddle.

### D. Coat Hook/Bumper:

1. Combination type, chrome plated Zamak.
2. Equip outswing handicapped doors with second door pull and door stop.

### E. Door Pulls: Chrome plated Zamak.

## 2.04 COMPONENTS

### A. Doors and Dividing Panels: 55 inches high, mounted 14 inches above finished floor.

### B. Pilasters: 83 inches high minimum, fastened to pilaster sleeves with stainless steel tamper resistant Torx head sex bolt, with stainless steel angle attachment to floor and ceiling.

### C. Pilaster Sleeves (Floor): 4 inches high, 20 gage stainless steel, secured to pilaster with stainless steel tamper resistant Torx head sex bolt.

### D. Wall Brackets: 54 inches long, heavy-duty aluminum, bright dip anodized finish, fastened to pilasters and panels with stainless steel tamper resistant Torx head sex bolts.

- E. Headrail: Heavy duty extruded aluminum (6463-T5 alloy) with anti-grip design. Headrail shall have a clear anodized finish and secured to headrail bracket with stainless steel tamper resistant Torx head screws. Headrail brackets shall be 20 gauge stainless steel with satin finish.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. Install compartments in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Install rigid, straight, plumb, and level.
- C. Locate bottom edge of doors and panels 14 inches above finished floor.
- D. Provide uniform, maximum 3/8 inch vertical clearance at doors.
- E. Not Acceptable: Evidence of cutting, drilling, or patching.

#### 3.02 ADJUSTING

- A. Adjust doors and latches to operate correctly.

End of Section

## SECTION 10 28 00 - TOILET ROOM ACCESSORIES

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish and install toilet room accessories and miscellaneous accessories as listed herein and shown on the drawings.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 06 10 00 Rough Carpentry

#### 1.03 SUBMITTALS:

- A Submit to the Architect for approval a brochure containing catalog cuts and full description of accessories proposed for use and a schedule of accessories.

### PART II PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS:

- A Accessories shall be catalog numbers listed as manufactured by Gamco. Other acceptable manufactures are:

1. American Specialties
2. Ketchem Co.
3. Taymor, Inc.
4. Better Home Products Co.

- B Approval of substitutions shall be based upon the submission of actual sample products in accordance with section 00800 of this publication.

#### 2.02 TYPE OF ACCESSORIES:

- |   |                                     |   |
|---|-------------------------------------|---|
| A | Grab bars:                          | Model No. 150S-T, 1 ½" dia., snap flange, peened. 12", 18", 24", 36", 42", 48" or as otherwise indicated on drawings. |
| B | Toilet Paper Dispenser:             | Model No. 761   |
| C | Paper Towel Dispenser:              | Model No. TD-2  |
| D | Towel Bar:                          | Model No. 751, 24" and 30".   |
| E | Soap dispenser:                     | Model No. G-16AP  |
| F | Soap Dish (Tub):                    | Ceramic with hand grab. Coordinate with section 09300   |
| G | Shower rod:                         | Bobrick Model No. B-4207x60   |
| H | Sanitary Napkin Disposal:           | Model No. ND-1  |
| I | Coat/Robe Hook:                     | Model No. 753, chrome   |
| J | Utility Shelf/Mop Holder/Rag Hooks: | Model No US-5   |

- K Folding Shower Seat Bobrick Model No. B-5191
- L Removable Bathtub Seat Reference note "N" below
- M Unframed Mirrors: 1/4" thick electro-plated by galvanic method and heat sealed. Provide one (1) year warranty on silver. Edges shall be flat polished. Mirrors shall be adhered to subsurface with "Mirror Mastic".
- N Removable bathtub seat for handicapped units (provide 1 each and turn over to Owner): SS-8. Contractor shall provide supplier with tub dimensions.

### PART III EXECUTION

#### 3.01 INSTALLATION:

- A Accessories shall be substantially secured in place with fastenings most suitable for the construction to which they are fastened. All exposed fasteners shall be stainless steel or chromium plated brass and shall be Phillips Head Screws or Bolts.
- B Grab bars: Finished installation of grab bars shall be capable of withstanding 250 lbs. pressure for 5 minutes.
- C For gyp. bd. installations where no wood blocking has been provided, install accessories using GCW40 as manufactured by: Winglts, LLC, 181 West Clay Avenue, Roselle Park NJ 07204, 1-877-894-6448, FAX 908-259-8922, Web site [www.winglts.com](http://www.winglts.com)
- D The exact location of accessories shall be as directed by the Architect.

End of Section

## SECTION 10 44 00 - FIRE EXTINGUISHERS

### 1PART I GENERAL

#### 1.01 SCOPE:

- A Furnish and install fire extinguishers and cabinets, as shown on drawings and as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBMITTALS:

- A Submit manufacturer's data for fire extinguishers and cabinets including mounting recommendations.

#### 1.04 QUALITY ASSURANCE:

- A Fire extinguishers shall be UL listed with UL listing mark for type, rating and classification of extinguisher.

### 2PART II PRODUCTS

#### 2.01 MATERIALS:

- A. Fire extinguishers shall be J. L. Industries Cosmic Series E, Model 10, Dry Chemical Extinguisher or products meeting or exceeding specified requirements by Elkhart, Casco, Larsen, Allenco, Badger-Powhatter or Ansul.
1. Where no cabinet is indicated in drawings, fire extinguishers shall be mounted with Mark Bracket MB846.
- B. Extinguisher cabinets shall be model 1526 with clear bubble, 1-1/2 inch square edge trim, powder coated steel frame cabinet. Cabinet shall have zinc plated handle and roller catch. Provide Mark Bracket MB846 for attachment of extinguisher inside cabinet. Fire extinguisher cabinets located in fire rated walls shall be provided with FX fire rated tub option.
- D. Fire extinguishers indicated in the drawings for mounting within a Kitchen shall be J. L. Industries Saturn Series, Class K, Wet Chemical Extinguisher or product meeting or exceeding the characteristics by Elkhart, Casco, Larsen, Allenco, Badger-Powhatter, and Ansul.

### 3PART III EXECUTION

#### 3.01 INSTALLATION:

- A Examine walls and partitions for thickness and framing for cabinets to verify cabinet depth and mounting prior to cabinet installation.
- B Follow manufacturer's printed instructions for installation.
- C Install in locations and at mounting heights located, or if not indicated, at heights to comply with applicable regulations of governing authorities.
- D Install fire extinguisher cabinets in fire rated walls in accordance with manufacturer's instructions for maintaining fire rating of wall assembly.

End of Section

## SECTION 10 55 50 – POSTAL SPECIALTIES

### PART I GENERAL

#### 1.01 SUMMARY

- A Furnish all labor, materials and equipment to provide complete installation of mail collection and delivery boxes.
- B Install in location as specified on drawings.

#### 1.02 RELATED DOCUMENTS

- A Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

#### 1.03 QUALITY ASSURANCE

- A Manufacturer: Provide products of manufacturers which are approved by U.S. Postal Service when mail system is serviced by USPS. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for preparation of substrate, installation of anchors, and application of postal units.
- B Requirements of Regulatory Agencies: Comply with U.S. Postal Service requirements for construction and installation of units serviced by USPS carriers.

#### 1.04 DELIVERY AND STORAGE

- A Delivery of material shall be coordinated with installation to minimize storage periods at the project site. Deliver in manufacturer's unopened container's bundles or packages, fully identified with manufacturer's name, brand, type and grade. Protect from weather, soiling and damage, using handling equipment and storage techniques recommended by the manufacturer.

#### 1.05 SUBMITTALS

- A Product Data: Submit manufacturer's technical data and installation instructions for postal specialties units required.
  - 1. Provide manufacturer's certification that equipment proposed conforms to U.S. Postal Service regulations and has been approved by the Postmaster General.
- B Samples: Submit samples, of each color and finish of exposed materials and accessories required for postal specialties.
- C Shop Drawings: Submit shop drawings for fabrication and erection of postal specialties. Include plans, elevations and large scale details. Show anchorages and accessory items. Provide location template drawings for items supported or anchored to permanent construction.

### PART II PRODUCTS

#### 2.01 PRODUCTS

- A Horizontal Front Loading Collection or Receiving Boxes:
  - 1. Fabricate of plate and heavy sheet metal components to sizes shown on drawings. Furnish units complete with hinged door with post office lock and matching trim kit. Provide ½" high engraved numbers in accordance with USPS requirements and as



approved by local authority assigning mailing address. Construct units of the following materials:

2. Aluminum, allow 6063-T5 within satin anodized finish NAAMM-M31C21A31.
- B Manufacturer: Subject to compliance with requirements, provide products by one of the following:
1. Salsbury Industries, Los Angeles, California  
(11) Type 4C, Model 3716D-20AFU and two front loading outgoing mailboxes with peripheral trim as shown.
  2. Bommer Industries, Landrum, SC
  3. Cutler-Federal, Inc., Eaton Park, FL
  4. Auth-Florence Manufacturing Co., Chicago, Illinois
- C Locks: 5 pin cylinder locks with 2 keys each.
- D Door sizes shall be as follows:
1. 220 type B doors for tenant use
  2. 22 type PL2 doors identified as "PARCEL" locker
  3. 11mail drops with slot and identified as "OUTGOING MAIL".
- E Configuration shall be as approved by the Architect.

### PART III EXECUTION

#### 3.01 INSTALLATION

- A Verify all dimensional requirements for mailboxes prior to installation.
- B Install all postal specialties in strict compliance with U.S. Postal Service requirements and in accordance with manufacturer's instruction and recommendations.

End of Section

## SECTION 10 57 16 - CLOSET ACCESSORIES

### PART I GENERAL

#### 1.01 DESCRIPTION:

- A Work Included: Furnish all labor, materials and equipment to provide a complete installation of closet shelving and rods as shown on the drawings and specified herein.

#### 1.02 QUALITY ASSURANCE:

Manufacturers: Compliance with requirements of these specifications.

#### 1.03 SUBMITTALS:

##### A Manufacturer's Data:

1. Submit two copies of manufacturer's specifications and installation instruction for each item covered by this section of the specifications.
2. Indicate by transmittal that a copy of each instruction had been distributed to the installer.

##### B Shop Drawing:

1. Submit one sample vinyl coated ventilated shelving unit.
2. Acceptable sample unit may be used in the work provided finish and dimensions comply with the requirements of this project.

### PART II PRODUCTS

#### 2.01 WIRE SHELVING:

- A Furnish and install vinyl-coated, steel-rod, ventilated shelving and storage system in locations and quantities as detailed on drawings, and with the following depths:

1. 12" deep with integral hanging rod at bedroom and coat closets.
2. 16" deep at linen closets, pantries, for shelves located above washer and dryers and at the rental office file room (4 high).
3. 24" deep at coat closets and shelves located above washer and dryers in Accessible units.

##### B Wire Shelving Physical Properties:

1. Materials: Grade C-1008 bright basic cold drawn steel wire.
2. Tensile strength: 1,000,000 PSI (average).
3. Cross deck spacing: 1" increments.
4. Coating: Non-exuding formula PVC.
5. Thickness: 7-11 mils (fluidized bed process).
6. Mounting hardware: Components shall provide for shelving installation to drywall without requiring mounting to conceal wall structure members. Support brackets shall be required for 3' span.

PART III EXECUTION

3.01 INSTALLATION:

- A Install shelving and rods plumb, level and snug to the supporting wall surface.
- B Attach to wall with manufacturer's recommended fasteners.
- C Provide additional brackets and clips, in handicapped units, which would enable the shelf to be lowered for use by a wheelchair bound resident, as indicated on the Drawings.

End of Section

## SECTION 11 31 00 – RESIDENTIAL APPLIANCES

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, equipment, and supervision necessary to provide and install residential appliances as shown on the drawings and as specified herein.

1. Cooking equipment, including ranges.
2. Refrigerator/freezers.
3. Microwaves
4. Range Hoods
5. Clothes washers and dryers
6. Dishwashers
7. Garbage disposals

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Division 22 Plumbing  
Division 26 Electrical

#### 1.03 SUBMITTALS:

- A Submit manufacturer's data and installation detail for approval before installation.

#### 1.04 WARRANTIES:

- A General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

- B Special Warranties: Written warranties, executed by manufacturer of each appliance specified agreeing to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.

1. Electric Range: One year parts and labor on entire appliance. .Five-year limited warranty for parts on glass ceramic cooking surface, oven elements and electronic oven controls.
2. Refrigerator/Freezer: Five-year limited warranty on the sealed refrigeration system. One year parts and labor on entire appliance.
3. Microwaves: One year parts and labor warranty on entire appliance.
4. Dishwasher: One year full parts and labor warranty on entire appliance.

### PART II PRODUCTS

#### 2.01 MATERIALS:

- A Electric Ranges: Provide and install electric ranges in all units. Basis of Design: General Electric Model #JB645FKDS (Model #JS760DLBB in accessible units and areas of public/common-use)

1. Acceptable manufacturers:
  - a. General Electric

- b. Whirlpool
  - c. Kenmore
  - d. Maytag
  - e. LG
  - f. Samsung
  - g. Frigidaire
- 2. Style: Free-standing
  - 3. Cooktop: Coil Heating Elements
  - 4. Color: Black
  - 5. Four burners minimum.
  - 6. Oven light.
  - 7. Oven view window.
  - 8. Two heavy duty chrome, adjustable oven racks.
  - 9. Dual control Bake-Broil elements.
  - 10. Hot surface indicator light.
  - 11. In locations intended for public use and/or private units indicated to be handicap accessible, range shall be certified as ADA compliant.

B. Clothes washers and dryers: Provide and install over/under clothes washers and dryers in Type A units as indicated on drawings. Basis of Design: GE Model #GTW685BSLWS-(W) & GTD65EBSJWS-(D). (Model #'s GFW430SSMWW & GFD43ESSMWW in accessible units and areas of public/common-use)

- 1. Acceptable manufactures:
  - a. General Electric
  - b. Frigidaire
  - c. Electrolux
  - d. Samsung
  - e. Maytag
  - f. Whirlpool
  - g. Kenmore
- 2. Color: Black
- 3. Front loader/front controls with LED display
- 4. 4.2 cu. ft. Ultra large capacity
- 5. Must be EnergyStar Qualified
- 6. 4.2 cu. ft. Ultra large capacity
- 7. Direct drive motor with 10 year warranty
- 8. UL listed. 120V, 12 amps/Electric

C. Refrigerators: Provide and install refrigerators in all units. Basis of Design: General Electric Model #GIE18CTHBB (Model # GIE18ETHBB in accessible units and areas of public/common-use)

- 12. Acceptable manufacturers:
  - a. General Electric
  - b. Frigidaire
  - c. Electrolux
  - d. Samsung
  - e. Maytag
  - f. Whirlpool
  - g. Kenmore
- 13. Color: Black
- 14. 17.5 cu.ft. total capacity minimum.

15. Must be EnergyStar Qualified
16. Frost-free Freezer
17. Factory-installed ice-maker
18. Large storage doors
19. Clear drawers and adjustable wire shelving
20. In locations intended for public use and/or private units indicated to be handicap accessible, refrigerator shall be certified as ADA compliant.

D Dishwashers: Provide and install dishwashers with power cords in all units. Basis of Design: General Electric Model #GSD3301KBB (Model #GTD225SGLBB with #GPFCORD in accessible units and areas of public/common-use)

1. Acceptable manufacturers:
  - a. General Electric
  - b. Whirlpool
  - c. Frigidaire
  - d. Samsung
  - e. LG
  - f. Maytag
  - g. Kenmore
2. Color/Finish: Black
3. 24" Built-in Dishwasher
4. Contractor to verify height is compatible with installing casework.
5. EnergyStar Qualified
6. Sound Rating: 64.0 maximum.
7. Two-stage water filtration system.
8. Hard food disposer
9. Heated drying cycle
10. Silverware Basket
11. In locations intended for public use and/or private units indicated to be handicap accessible, dishwashers shall be certified as ADA compliant.

E Over-The-Range Microwave: Provide and install over-the-range microwaves with recirculating venting in all living units not indicated to be ADA/accessible. Basis of Design: General Electric General Electric Model #JVM3160DFBB

1. Acceptable Manufacturers:
  - a. General Electric
  - b. Samsung
  - c. LG
  - d. Kenmore
  - e. Frigidaire
  - f. Maytag
  - g. Sharp
2. Color: Black
3. 300 cfm minimum ventilation capacity with 2-speeds
4. Contractor to coordinate ventilation requirements.
5. Cooktop Lights
6. Width: 30"
7. UL Listed.
8. 950 Watts Minimum
9. Turntable
10. 1.5 cu.ft. capacity minimum.

F Countertop Microwave: Provide and install countertop microwaves in all common-use areas and ADA/accessible units. Basis of Design: General Electric Model # PES7227DLBB

1. Acceptable Manufacturers:

- a. General Electric
- b. Samsung
- c. LG
- d. Kenmore
- e. Frigidaire
- f. Maytag
- g. Sharp

- 2. Color: Black
- 3. Width: 24"
- 4. Capacity: 2.2 cu. ft.
- 5. UL Listed.
- 6. 1100 Watts Minimum
- 7. Turntable
- 8. 2.0 cu.ft. capacity minimum.

I. Garbage Disposal: Provide and install garbage disposals under all sinks. Basis of Design: General Electric Model #GFC325N

1. Acceptable Manufacturers:

- a. General Electric
- b. InSinkErator
- c. Whirlpool
- d. Frigidaire
- e. Waste King
- f. KitchenAid

- 2. Motor: 1/3hp minimum, 2500 RPM minimum.
- 3. Grind Chamber Capacity: 27.0 minimum
- 4. Provide and install wall switch in approved location in compliance with ADA requirements.
- 5. UL listed.

L Under-Cabinet Range Hoods: Provide and install under-cabinet range hoods in all ADA/accessible units with countertop microwaves. Basis of Design: General Electric Model #JN327HBB:

1. Acceptable Manufacturers:

- a. General Electric
- b. Air King
- c. Broan Nutone
- d. Zephyr

- 2. Color: Black
- 3. Ductless/Recirculating Type
- 4. Replaceable filter included.
- 5. Fan adjustable low, high, off
- 6. Two lights – include bulbs.
- 7. Width: 30"
- 8. UL Listed.

## 2.02 ACCESSORIES

- A. Power Cords: Provide power cords for all appliances, whether or not they are a standard accessory. All power cords shall be as supplied by the appliance's manufacturer.
- B. Venting: Provide all necessary materials, including duct and exterior hoods to properly vent appliances which are recommended or required to be vented by the manufacturer.

## PART III EXECUTION

### 3.01 EXAMINATION:

- K Examine roughing-in for plumbing, mechanical, and electrical services, with Installer present, to verify actual locations of services before residential appliance installation. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION:

- K General: Comply with manufacturer's written instructions.
- L Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- M Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- N Install all power and venting accessories (including power cords) necessary for full function.
- O Utilities: Refer to Divisions 22 and 26 for plumbing and electrical requirements.

### 3.03 ADJUSTING AND CLEANING:

- K Test each item of residential appliances to verify proper operation. Make necessary adjustments.
- L Verify that accessories required have been furnished and installed.
- M Remove packing material from residential appliances and leave units in clean condition, ready for operation.

End of Section



## SECTION 12 21 14 – VINYL HORIZONTAL BLINDS

### 1PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, equipment and supervision necessary to provide and install horizontal blinds in all exterior windows.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBMITTALS:

- A Submit manufacturer's data showing installation details and color choices for selection by the Architect.
- B Samples for Verification: For the following products, prepared on Samples from the same material to be used for the Work.
  - 1. Louver Slat: Not less than 12 inches (300 mm) long.

#### 1.04 PROJECT CONDITIONS:

- A Environmental Limitations: Do not install horizontal louver blinds until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

#### 1.05 WARRANTY:

- 2A. Manufacturer's standard warranty for not less than 2 Years.

### 3PART II PRODUCTS

#### 3.01 MATERIALS:

- A Horizontal louver blinds shall be Riviera Classic 1 inch metal blinds as manufactured by Levolor Contract, a Newell Company or product meeting or exceeding the specified requirements by one of the following manufacturers.
  - 1. Comfortex Window Fashions.
  - 2. Springs Window Fashions Division, Inc.
  - 3. Lotus
- B Color pattern texture and gloss of louvers shall be selected by the Architect from the manufacturer's standard offerings.
- C Louver Slats: 6 Gauge premium metal slats, width with crown of .160".
  - 1. Opacity: 75%

2. Must pass NFPA 701 small scale flammability test
- D Headrail: Extruded PVC 1.135" width x .935" height x .070" thick for widths less than 69". For widths 69" and greater the headrail shall measure 1.500" width x 1.500" height x .070" thick.
- E Bottom Rail: Extruded hollow PVC 1.035" width x .450" height x .055" thick.
- F Tilt Control: Injection molded plastic housing with steel wand hook. Gear ratio of 9:1.
  1. Tilt Operation: Manual with clear plastic wand.
  2. Length of Tilt Control: Length required to make operation convenient from floor level.
  3. Tilt: Full.
- G Lift Operation: Manual, cord lock; locks pull cord to stop blind at any position in ascending or descending travel.
- H Tilt-Control and Cord-Lock Position: Right side and left side of headrail, respectively unless otherwise indicated.
- I Ladders: Evenly spaced to prevent long-term louver sag.
  1. For Blinds with Nominal Slat Width 1 inch or Less: .840" woven polyester.
- J Valance: Two louver slats.
  1. Finish Color Characteristics: Match color, texture, pattern, and gloss of louver slats
- K Mounting: Wall mounting unless otherwise indicated on Drawings, mounting permitting easy removal and replacement without damaging blind or adjacent surfaces and finishes; with spacers and shims required for blind placement and alignment indicated.
  1. Provide intermediate support brackets if end support spacing exceeds spacing recommended by manufacturer for weight and size of blind.
  2. Color coordinates PVC.
- L Hold-Down Brackets and Hooks or Pins: Manufacturer's standard, as indicated.

### 3.02 HORIZONTAL LOUVER BLINDS FABRICATION:

- A Each horizontal louver blind designed to be self-leveling and consisting of louver slats, rails, ladders, tapes, lifting and tilting mechanisms, cord, cord lock, tilt control, and installation hardware.
- B Concealed Components: Non-corrodible or corrosion-resistant-coated materials.
  1. Lifting and Tilting Mechanisms: With permanently lubricated moving parts.
- C Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74° F:
  1. Blind Units Installed between (Inside) Jambs: Width equal to 1/4 inch per side or 1/2 inch total, plus or minus 1/8 inch, less than jamb-to-jamb dimension of opening in which each blind is installed. Length equal to 1/4 inch, plus or minus 1/8 inch, less than head-to-sill dimension of opening in which each blind is installed.

2. Blind Units Installed Outside Jambs: Width and length as indicated, with terminations between blinds of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
- D Installation Brackets: Designed for easy removal and reinstallation of blind, for supporting head-rail, valance and operating hardware, and for hardware position and blind mounting method indicated.
- E Installation Fasteners: Not fewer than two fasteners per bracket, fabricated from metal non-corrosive to blind hardware and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.

#### 4PART III EXECUTION

##### 4.01 HORIZONTAL LOUVER BLIND INSTALLATION:

- A Install blinds level and plumb and aligned with adjacent units according to manufacturer's written instructions, and located so exterior louver edges in any position are not closer than 1 inch to interior face of glass. Install intermediate support as required to prevent deflection in headrail. Allow clearances between adjacent blinds and for operating glazed opening's operation hardware, if any.
- B Flush Mounted: Install blinds with louver edges flush with finish face of opening if slats are tilted open.
- C Jamb Mounted: Install headrail flush with face of opening jamb and head.
- D Head Mounted: Install headrail on face of opening head.
- E Recessed: Install headrail concealed within blind pocket.

##### 4.02 ADJUSTING:

- A Adjust horizontal louver blinds to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

##### 4.03 CLEANING AND PROTECTION:

- A Clean blind surfaces after installation, according to manufacturer's written instructions.
- B Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, that ensure that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.
- C Replace damaged blinds that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

End of Section

## SECTION 12 35 30- KITCHEN AND VANITY CASEWORK

### 1PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, equipment and supervision necessary to provide and install pre-manufactured kitchen and vanity casework as shown on the drawings and specified herein.
- B Furnish all labor, materials, equipment and supervision necessary to provide and install countertops where indicated in drawings as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBMITTALS:

- A Submit the following according to Section 01 33 00:
  - 1. Product data for each casework type specified including manufacturer's specifications and installation instructions, details of construction relative to materials, dimensions of individual components, profiles, and finishes.
  - 2. Shop drawings showing layout and types of counter tops, full scale sections of typical installations, details of patterns or designs, and colors.
  - 3. 12 inch square samples of plastic laminate for verification of color selection.
  - 4. Product certificates signed by the manufacturer certifying that materials furnished comply with specified requirements.
  - 5. Maintenance data for kitchen casework to include in the Operating and Maintenance Manual specified in Division 1.

#### 1.04 PROJECT CONDITIONS:

- A Field Measurements: Check actual area for casework by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work.
- B Comply with casework manufacturer's written requirements for temperature and humidity conditions during storage and installation. Do not install casework until these conditions have been attained and stabilized.
- C Verify countertop size and shape prior to fabrication by field measurements taken after base units are installed.

#### 1.05 QUALITY ASSURANCE:

- A Plastic Laminate Countertops: Comply with ANSI A161.2.
- B Single Source Responsibility: Obtain kitchen casework from one source of a single manufacturer.

## 2PART II PRODUCTS

### 2.01 MANUFACTURERS:

#### A Casework

1. Avalon Series (standard overlay) as manufactured by Saco Industries in configuration(s) indicated on the drawings or product meeting or exceeding the specified requirements by:
  - a. Grandview
  - b. North American
  - c. Evans
  - d. Master Woodcraft
  - e. Armstrong
  - f. Republic Industries
  - g. Wellborn Forest

#### B Plastic Laminate Covered Millwork:

1. Plastic laminate shall be as indicated on drawings. If not indicated, provide 1/32" plastic laminate selected by Architect from manufacturer's full range (including all premium and/or high definition series/categories) by Nevamar Corporation., Formica Corporation, or Wilsonart Corporation. Interior of drawer and cabinet shall have cabinet liner laminate.
2. Basis of Design: Particle board shall be high density industrial grade "Novaply". Tops shall be 1-1/2" thick. All other shall be 3/4" thick unless otherwise detailed.
3. Facing material shall be bonded to core with water-resistant adhesive under controlled pressure. Bonding shall be controlled to produce a flat smooth surface laminate.
4. Laminated plastic work shall be cleaned free of misplaced adhesive, shop marks and trademarks by the fabricator. Subsequent cleaning, removal of paint, dust, etc., shall be the responsibility of the Contractor.
5. Plastic laminate all exposed surfaces including interior of open cabinets.
6. Edges of all cabinet doors and drawer fronts shall be laminated with 3 mm PVC in color selected to coordinate with plastic laminate applied to flat surfaces.
7. Gluing: All gluing shall be done with a nationally recognized glue, in strict accordance with manufacturer's recommendations, using water-resistant urea-formaldehyde resin glue for exterior for damp conditions. Type 1, waterproof glue shall be used for extreme conditions. Where widths or thicknesses are not available in hardwoods, gluing may be used on widths over 5-1/2", or thicknesses over 1/16".
8. All drawer faces, backs and sides shall be hardwood.
9. Adjustable shelves shall be adjustable on 2" centers. Provide necessary hardware.
10. Drawer bottoms shall be 1/4" hardboard laminated with plastic laminate.
11. Comply with ANSI A161.2
12. Particleboard: Comply with ANSI A208.1 45 lb. Density, not less than 3/4" thick.
13. Countertop, Backsplash, and End splash: To match countertops and provided where applicable.

### 2.02 ADHESIVES, GROUT, SEALANTS, AND ACCESSORIES

A. General: Use only adhesives recommended by their manufacturer for the application indicated.

B. Water-Cleanable Epoxy Adhesive: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Bonsal, W. R. Company.
  - b. Bonstone Materials Corporation.
  - c. C-Cure.
  - d. Custom Building Products.

- e. Laticrete International, Inc.
  - f. MAPEI Corp.
  - g. Summitville Tiles, Inc.
- C. Water-Cleanable Epoxy Grout: ANSI A118.3, chemical-resistant, water-cleanable, tile-setting and grouting epoxy, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - a. Available Manufacturers: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
  - b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - i. Boiardi Products Corporation.
    - ii. W. R. Bonsal Company.
    - iii. Bostik Findley Inc.
    - iv. C-Cure.
    - v. Custom Building Products.
    - vi. Laticrete International, Inc.
    - vii. MAPEI Corp.
    - viii. Summitville Tiles, Inc.
    - ix. TEC Incorporated; H. B. Fuller Company.

## 2.03 PART III EXECUTION

### 2.02 INSTALLATION:

- A Install casework with no variations in flushness of adjoining surfaces using concealed shims. Where casework abuts other work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match casework face.
- B Install casework without distortion so that doors and drawers fit openings properly and are aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessories as indicated.
- C Install casework and countertop level and plumb to a tolerance of 1/8" in 8 feet.
- D Fasten unit of casework to adjacent unit and into structural support members of wall construction with #10 sheet metal or wood screws with washer head or washer.
- E Fasten plastic laminate countertops by screwing through corner blocks in base units into the underside of countertop. Spline and glue joints in countertops and provide concealed mechanical clamping of joint.

### 2.03 ADJUSTING AND CLEANING:

- A Adjust hardware to center doors and drawers in openings and lubricate to provide unencumbered operation
- B Clean casework on exposed and semi-exposed surfaces. Touch-up factory-applied finishes to restore damaged or soiled areas.

### 2.04 PROTECTION:

- A Cover countertops with non-staining paper until time of Substantial Completion for Project.
- B Protect cabinets from damage. Replace damaged cabinets at completion of Project.

End of Section



## SECTION 31 10 00 – SITE PREPARATION

### 1PART I GENERAL

#### 1.01 SCOPE:

- A Work shall include, but not be limited to: Protection of existing trees to remain, removal of trees and other vegetation scheduled to be removed, topsoil stripping, clearing, grubbing, and removal of above and below grade improvements.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

Section 31 20 00 Earthwork

#### 1.03 PROJECT CONDITIONS:

- A Traffic: Conduct site clearing operations to ensure minimum interference with roads, streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.
- B Protection of Existing Improvements:
1. Provide protections necessary to prevent damage to existing improvements indicated to remain.
  2. Protect improvements on adjoining properties and on the Owner's property.
  3. Restore damaged improvements to their original condition, as acceptable to property owners and other parties having jurisdiction
- C Protection of Existing Trees and Vegetation:
1. Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering or trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within the drip line. Provide temporary guards to protect trees and vegetation to be left standing.
  2. Water trees and other vegetation to remain within the limits of the contract work as required to maintain their health during the course of construction operations.
  3. Provide protection for roots over 1-1/2" diameter cut during construction operations. Coat the cut faces with an emulsified asphalt, or other acceptable coating, formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out. Cover with earth as soon as possible.
  4. Repair or replace trees and vegetation indicated to remain which are damaged by construction operations, in a manner acceptable to the Architect. Employ a licensed arborist to repair damages to trees and shrubs. Replace trees which cannot be repaired and restored to full growth status, as determined by the arborist.
- D Salvageable Improvements: Carefully remove items indicated to be salvaged, and store on the Owner's premises where indicated or directed.

### 2PART II PRODUCTS

NOT USED

### 3PART III EXECUTION

#### 3.01 SITE CLEARING:



A General:

1. Remove trees, shrubs, grass, and other vegetation, improvements, or obstructions as required to permit installation of new construction. Remove similar items elsewhere on the site or premises unless specifically indicated to remain. Removal includes digging out and off-site disposing of roots and stumps.
2. Carefully and cleanly cut minor roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction.

B Topsoil:

1. Topsoil is defined as friable clay loam surface soil found in depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, and without weeds, roots, and other objectionable material.
2. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material.
3. Remove heavy growths of grass from areas before stripping.
4. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
5. Stockpile topsoil in storage piles in areas shown, or where otherwise directed. Construct storage piles to freely drain surface water. Cover storage piles if required to prevent windblown dust.

C Clearing and Grubbing:

1. Clear site of trees, shrubs and other vegetation, except for those specifically indicated to be left standing.
2. Completely remove stumps, roots, and other debris protruding through the ground surface.
3. Use only hand methods for grubbing inside the drip lines of trees indicated to be left standing.
4. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
5. Place fill material in horizontal layers not exceeding 6 inches loose depth, and thoroughly compact to a density equal to adjacent original ground.

D Removal of Improvements:

1. Remove above-ground and below-grade improvements as indicated and as necessary to facilitate new construction.
2. Abandonment or removal of certain underground pipe or conduits may be shown on mechanical or electrical drawings, and is included under work of related Division 15 and 16 Sections. Removal of abandoned underground piping or conduit interfering with construction is included in this Section.

3.02 DISPOSAL OF WASTE MATERIALS:

A Burning is not permitted on the Owner's property.

B Remove waste materials and unsuitable or excess topsoil from Owner's property and dispose of legally.

End of Section

## SECTION 31 20 00 - EARTHWORK

### PART I GENERAL

#### 1.01 SCOPE:

- A Do all excavating, filling, backfilling, grading, and all necessary incidental work in connection therewith, required to install all work shown and specified under the Contract.
- B Work shall include, but not be limited to: Soils Engineer monitoring, topsoiling and fine grading of areas to be seeded; topsoiling and fine grading of planting areas; excavating and grading for building drives and walks, controlled filling and porous fill.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

Section	01 40 00	Quality Control
Division	20	Plumbing
Division	26	Electrical
Division	33	Utilities

#### 1.03 EXAMINATION OF THE SITE:

- A Bidders upon work under this section, before submitting bids, shall visit and carefully examine the site so as to familiarize themselves with the existing conditions, including amount of topsoil available, and the difficulties that will affect the execution of the work. The submission of a bid will be construed as evidence that such an examination has been made.

#### 1.04 DETERMINATION OF FOUNDATION BEARING CAPACITY BY GEOTECHNICAL ENGINEER:

- A Foundation bearing capacity shall be determined on the basis of scientific analysis utilizing investigations, tests, or studies conducted or provided by the soils testing engineer.
- B Documentation of foundation bearing capacity shall be submitted to the Structural Engineer of record. Submittal shall identify the project, contain the name, address and registration number of the designated engineer and shall indicate type and frequency of tests performed as well as their location within the project.

#### 1.05 SUBMITTALS:

- A Submit one copy of permits and notices obtained from authority having jurisdiction before commencing work.
- B Obtain and submit certification of adequacy of site grading and filling from Testing Laboratory, signed and sealed by the Geotechnical Engineer of record, registered in the state in which the work is performed, stating that work is in accordance with Contract Documents, and that soils are capable of supporting the structure to be constructed under the Contract.
- C If bench marks and other permanent reference points are displaced, obtain and submit certification, signed and sealed by a licensed surveyor, of proper re-establishment of bench marks and reference points.
- D The Contractor shall submit samples of approximately 50 pounds each of the fill materials he proposes to use to testing agency approved by the Owner at least ten (10) days prior to its use. The testing agency shall test such samples, classify them as specified by U.S. Bureau of Public Roads, and determine the moisture-density in pounds per cubic foot of oven-dried weight.

1.06 PROJECT CONDITIONS:

- A Test borings and other investigatory operations may be undertaken by Contractor at the Contractor's option. However, no change in Contract Amount will be made for such operations.
- B Notify Owner's representative when excavations have reached required elevations. If it is determined that bearing materials are unsuitable, continue excavations until suitable bearing is encountered.
- C Locate and, where indicated to remain, protect and support existing utilities. If uncharted or incorrectly charted items are encountered, immediately notify utility company and cooperate with utility company's directives. Cooperate with Owner and utility companies in order to keep services and facilities in operation. Repair any damages caused by Work to the satisfaction of the affected utility company.
- D If utility service must be interrupted, give 72-hour notice to Owner's representative, and obtain written approval prior to such interruption.
- E Provide barricades and warning lights for open excavations. Operate warning lights as and when recommended by authorities having jurisdiction. Remove such protective items when no longer required.
- F Protect structures, utilities, sidewalks, paving, and other facilities from damage due to settlement, lateral movement, undermining, washout, and other hazards resulting from earthwork operations.
- G Root systems of trees to remain are to be protected from damage or drying out; cover exposed roots with burlap.

PART II PRODUCTS

2.01 DRAINAGE FABRIC:

- A Non-woven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
  - 1. Grab Tensile Strength: 110 lbf (490 N); ASTM D 4632.
  - 2. Tear Strength: 40 lbf (178 N); ASTM D 4533.
  - 3. Puncture Resistance: 50 lbf (222 N); ASTM D 4833.
  - 4. Water Flow Rate: 150 gpm per sq. ft. (100 L/s per sq. m); ASTM D 4491.
  - 5. Apparent Opening Size: No. 50 (0.3 mm); ASTM D 4751.

2.02 BURIED WARNING AND IDENTIFICATION TAPE:

- A. Polyethylene plastic and metallic core or metallic-faced, acid and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read "CAUTION BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.

Warning Tape Color Codes:

Yellow	Electric
Yellow	Gas, Oil, Dangerous Materials
Orange	Telephone and Other Communications
Blue	Water Systems
Green	Sewer Systems

White Steam Systems

- B. Warning Tape for Metallic Piping: Acid and Alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of tape shall be 0.003 inch. Tape shall have a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.

2.03 BACKFILL MATERIAL:

- A Backfill material shall be a type that can be compacted to the densities specified under the conditions existing at the site at the time it is placed.
- B Stone for compacted backfill under slabs shall be evenly graded mixture of crushed stone or crushed or uncrushed gravel, with one hundred percent (100%) passing a 1-1/2" sieve and not more than five percent (5%) passing a No. 4 sieve.
- C Earth for compacted backfill and engineered fill shall consist of clean granular soils, clay soils, or shale soils having a plasticity index of less than 30 and a minimum density of 90 pounds per cubic foot when compacted to one hundred percent (100%) of its maximum dry density per standard proctor test. (ASTM D698) Material shall be free of vegetation, roots, rocks larger than 2" in any dimension, debris and other deleterious materials. Residual soil excavated at the site may be used for backfill if it meets the specification requirements. The moisture content of the fill soils should be maintained within +3 and -3 percentage points of optimum moisture content determined from the standard Proctor compaction test.
- D Cohesive soils that have become hard and lumpy or that have been piled and become dry shall be broken up and properly conditioned for optimum moisture content immediately before using as backfill. However, in no case shall earth backfill be wetted or puddled in place.
- E Backfill at retaining walls (if any) shall be ASTM #57 or #67 stone.

2.04 ENGINEERED FILL:

- A All fill in areas to be occupied by the building(s) and paving, including an area 10 feet outside the perimeters thereof, and any areas noted on the site plan as "Future Expansion" shall be controlled (engineered) fill and the compaction shall be tested by an Agency as specified in Section 01 40 00 Quality Control. Controlled fill in areas of buildings shall be compacted in thin lifts to at least 98% of maximum dry density within 3% of optimum moisture content in accordance with ASTM Specification D-698 (standard proctor). Fill in areas of asphalt paving shall be compacted in thin lifts to at least 98% of maximum dry density within 3% of optimum moisture content in accordance with ASTM Specification D 698. The upper 12 inches of fill beneath pavements and upper 24 inches beneath footings and grade slabs shall be compacted to 100%.
- B Where rock is excavated to 24 inches below footings, the footing excavations shall be refilled from top of rock to bottom of footings with controlled compacted fill.

2.05 TOPSOIL:

- A Shall be natural, fertile, agricultural soil, capable of sustaining vigorous plant growth. It shall be of uniform friable clay loam composition throughout, without admixture of subsoil. Soil shall be free of stones, lumps, live plants and their roots, sticks and other extraneous matter. The soil shall not be contaminated with substances harmful to the growth of plants and humans. It shall have a pH range of 5.0 to 7.0, and contain not less than five percent (5%) organic matter. The topsoil shall be free of noxious weeds, grasses or other foreign vegetation which would cause maintenance problems for the Owner after the contract is complete. Contractor shall assume full responsibility for control of noxious species introduced by the addition of soil infested with such species for a period of one year from Provisional Acceptance of the Work.

2.06 UNDERCUT AT FOUNDATIONS:

- A Undercut and backfill with compacted stone at foundations shall be performed if directed by the Architect, based on the results of in place testing of earth at foundation sub-grades. In areas where unsuitable soils are encountered at or near foundation level, the foundation shall be undercut to a depth and width of two times the foundation bearing level or to competent bearing soils. The trench shall be backfilled with compacted stone to the level of foundation bearing.

2.07 CLASSIFICATION OF EXCAVATED MATERIALS:

- A Materials to be excavated shall be unclassified. Excavating shall include the removal of all materials encountered, both natural and artificial.
- B It is understood that full compensation has been included in the Base Bid amount for all excavation work, including the furnishing and installing of all filling and backfilling materials required, the removal of rock and excavating and backfilling of areas of unsuitable soil except work required because of differing site conditions as defined hereinafter.

2.08 GROUNDWATER IN EXCAVATIONS:

- A Ground water may be encountered in the course of the work. The Contractor shall coordinate his work so that any ground water is controlled and directed to existing or newly constructed storm drainage structures. Measures such as temporary trenching and pumping should be anticipated and shall not be given consideration as differing site conditions.

2.09 DIFFERING SITE CONDITIONS:

- A The Contractor shall promptly, and before such conditions are disturbed, notify the Architect in writing of sinkholes or caves encountered in excavations.
- B The Architect and the Soil Engineer will promptly investigate the conditions, and if they find such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for performance of any part of the work under this Contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the Contract modified in writing accordingly by a change order.
- C No claim of the Contractor under this clause shall be allowed unless the Contractor has given the notice required in Subparagraph A above; provided, however, the time prescribed therefore may be extended by the Owner.
- D No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under the Contract.

PART III EXECUTION

3.01 ROCK EXCAVATION:

- A Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu.yd. for bulk excavation or 3/4 cu.yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting (when permitted):
1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator equivalent to Caterpillar Model No. 3201; equipped with a 24 inch wide, short-tip-radius rock bucket; rated at not less than 120 hp flywheel power with bucket-curling force of not less than 25,000 lbf and stick-crowd force of not less than 18,700 lbf; measured according to SAE J-1179.

2. Bulk Excavation: Late-model, track-mounted loader equivalent to Caterpillar Model No. 973; rated at not less than 210 hp flywheel power and developing a minimum of 45,000 lbf breakout force; measured according to SAE J-732.
- B Before placing concrete or masonry or rock surfaces, the surfaces shall be leveled off, or shelved, to a slope not exceeding one inch per foot.
- C If the use of explosives is required or desired by the Contractor, Contractor shall present written evidence of appropriate insurance, have written permission from the Architect and all authorities having jurisdiction prior to bringing explosives onto job site or using in the work and shall implement all precautionary measures deemed necessary by all authorities having jurisdiction.
- D If rock is encountered, it shall be excavated to the following limits:
1. Two feet outside of concrete work for which forms are required, except footings.
  2. One foot outside the perimeter of footings and two feet below bottom of footings.
  3. One foot below concrete floor slabs on grade.
  4. In all pipe trenches, 6" below invert elevation of pipe and 2 feet wider than the inside diameter of the pipe, but not less than three feet trench width. Contractor shall notify officials prior to detonation of explosives or beginning noisy drilling operations.
  5. In all other excavated areas: 2 feet below finished grade.

### 3.02 EXCAVATIONS:

- A Excavation shall be to depth and of form and size required for installation of work shown on the drawings. Excavations for foundation walls shall be large enough to provide sufficient working space to permit the proper placing and inspection of forms, waterproofing, sleeves, and similar items, and the installation of foundation drains where such drains are shown. Excavation for slabs on grade shall be deep enough to allow for placing porous fill of depths specified under the slabs.
- B Excavation for wall and column footings shall be to firm undisturbed earth or engineered earth fill, sides square and bottoms level. Changes in level of wall footings shall be made by stepping and not by sloping. Trenches, if excavated properly, may be used to maintain the concrete for all footings without the use of forms.
- C Excavations in earth for footings, slabs, walks, and other structures shall not be made to full depths required when freezing temperatures or rain may be expected. Concrete footings shall be placed immediately after excavation is completed. Freezing or water damaged excavations shall be carried deeper as required and backfilled as necessary at no additional cost to the Owner. The Soils Engineer shall observe all footing excavations immediately prior to placing reinforcing steel or concrete.
- D After excavating and rough grading the building areas, and areas to be paved which are in cut, to the required subgrade elevations, and after topsoil has been removed from building areas and areas to be paved which are to receive engineered fill, these areas shall be proof-rolled by the Contractor in the presence of the Soils Engineer using a fully-loaded dump truck or similar pneumatic-tired equipment. Any areas exhibiting significant deflection, in the opinion of the Soil Engineer, shall be stabilized as directed prior to placing any fill. If areas exhibiting deflection cannot be stabilized by compaction, the unsuitable soil shall be undercut as directed by the Soil Engineer and replaced with engineered fill.
- E Any existing underground pipes or electrical conduits that are in service encountered during the excavation shall be temporarily supported and maintained until permanent support has been restored, or until other disposition has been made as directed by the Architect. Existing underground pipes encountered that have been abandoned or are to be abandoned shall be removed to a point outside the construction excavation and plugged.

- F All non-engineered fill shall be removed in the area of the new construction and replaced with engineered fill. All footing excavations shall be examined and approved by a senior engineering technician working under the direct supervision of a Geotechnical engineer immediately prior to placing reinforcing steel or concrete. Modifications shall be made to the excavation if the Soils Engineer determines that the excavation is not in compliance with the drawings or specifications.
- G In cut areas, excavation shall extend below any deleterious materials or unsatisfactory soil as specified.
- H Cut shall not be carried deeper than necessary to reach required elevations. Fill shall be clean earth as specified for backfilling. Fill shall be placed evenly over the entire area to be filled, in layers. Each layer shall be thoroughly compacted to sufficient density to prevent unsightly settlement.
- I. Excavations in earth for footings, slabs, walks, and other structures shall not be made to full depths required when freezing temperatures or rain may be expected. Concrete footings shall be placed immediately after excavation is completed. Freezing or water damaged excavations shall be carried deeper as required and backfilled as necessary at no additional cost to the Owner.
- J. Foundation Bearing Materials Testing: The Soils Engineer shall observe all footing excavations immediately **prior to placing reinforcing steel or concrete.**
1. For foundations bearing on residual (natural) soils, the bearing materials shall be probed with a minimum 1/2 inch diameter steel probe rod to detect weaker materials. Weaker materials detected by probing shall be tested with dynamic cone penetrometer to verify the design bearing capacity. Test frequency shall be one cone penetrometer test per four individual foundations and per 100 linear feet of strip foundations.
  2. For foundations bearing on fill (under the present contract) soils, the bearing materials shall be probed with a minimum 1/2 inch diameter steel probe rod to detect weaker materials. Weaker materials detected by probing shall be tested with a nuclear density gauge to verify the in-place percent compaction conforms to the applicable compaction criteria. Test frequency shall be one nuclear density test per four individual foundations and per 100 linear feet of strip foundations.

### 3.03 UNSUITABLE SOIL:

- A In building or paving areas where unsuitable soil conditions are encountered which cannot be stabilized by compaction, or where in the opinion of the Soil Engineer attempting stabilization by compaction would be unsuccessful, the unsuitable soil shall be excavated and removed from the site and the area backfilled with engineered fill specified hereinafter.

### 3.04 PROTECTION OF EXISTING WORK AND LANDSCAPE FEATURES:

- A Excavating, filling, backfilling and grading shall be performed in such a manner and by such methods that will not damage existing structures, existing underground piping, existing overhead wiring, existing trees (unless noted to be removed), and other landscaping planting.
- B Protect, maintain and restore benchmarks, monuments, and other reference points affected by this work. If bench marks, monuments or other permanent reference points are displaced or destroyed, points shall be re-established and markers reset under supervision of a licensed surveyor who shall furnish Architect with certification of his work.

### 3.05 PROTECTION OF EXCAVATION:

- A Excavation and grading operations shall be performed in a manner that will ensure positive and rapid surface run off of water away from the building area at all times.

- B Banks, slopes and adjacent structures shall be fully protected against harmful sluffing and erosion, by the use of shoring or other temporary construction, if necessary. The excavations shall be kept free of water by temporary dams or drains, pumping or other adequate means, until backfilling is completed.

### 3.06 STABILITY OF EXCAVATION

- A. General: Comply with local codes, ordinances, and requirements of agencies having jurisdiction.
- B. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- C. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good serviceable condition. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.
- D. Provide permanent steel sheet piling or pressure-creosoted timber sheet piling wherever subsequent removal of sheet piling might permit lateral movement of soil under adjacent structures. Cut off tops a minimum of 2'-6" below final grade and leave permanently in place.

### 3.07 BACKFILLING:

- A Excavation below the finished grade shall be backfilled after removing forms, shoring and similar temporary work and after waterproofing, piping, and other underground work has been installed, inspected and approved. Any caving of excavations or any backfill placed before inspections are completed shall be removed as the Architect or Engineer may deem necessary.
- B Material and compaction of backfill for excavations in controlled fill shall conform to requirements specified for controlled fill.
- C Backfill material for use in areas to be seeded or planted shall be clean earth, free from large stones or rock fragments, large roots and debris, but may contain loam or similar organic matter. Backfill in these areas shall be compacted to a density that will prevent unsightly settlement after the finished grading is completed.
- D All backfill, not otherwise specified, shall be deposited in layers not over 10" loose thickness and each layer shall be compacted by light compaction equipment as it is placed.
- E Install porous backfill under concrete slabs on grade. Porous backfill thickness shall be not less than 4" under slabs. Where rock is excavated to 12 inches below concrete floor slabs on grade excavations shall be refilled from top of rock to bottom of slab with porous backfill.
- F Finish grade shall slope away from the structure on all sides.
- G After all turf, topsoil, roots, debris and other objectionable materials that would cause interference with the compaction of the fill have been removed, the area to be filled shall be scarified and broken to a depth of 8 inches. A thin layer, 3 inches thick, of the specified fill material shall be spread on the scarified base and the whole compacted as specified.
- H The fill shall be formed of successive horizontal layers of 6 to 8 inches loose depth deposited in windows and machine spread. Each layer shall be compacted to the percentage of maximum density at optimum moisture content specified by means of sheeps-foot rollers, or other approved mechanical compacting machines. Where the fill is inaccessible to tamping rollers, it shall be consolidated and compacted by mechanical hand tampers.



- I During the fill operation, field compaction tests by means of the Ottawa Sand and Cone Method, ASTM D1556, or other acceptable method, shall be made as often as deemed necessary by the selected testing agency to determine the percent compaction of any completed layer. There shall be taken not less than one compaction test for every 900 square feet for each foot depth to fill. There shall be a representative of the testing agency present on site at all times when engineered fill is being placed. If such test shows failure to meet the required compaction due to insufficient moisture, too much moisture, insufficient rolling or other causes, the Contractor shall remedy the condition by bringing the material to optimum moisture content or by continued rolling and re-compaction. In no case shall the Contractor be permitted to continue filling if the underlying layers fail to meet compaction requirements.
- J The Contractor shall maintain drainage and dryness so that there will be no undue saturation of the fill while the work is in progress. If an area becomes saturated, the Contractor shall remove all soft materials, scarify and re-compact to the required density.
- K Fill in areas other than those where controlled fill is specified shall be earth fill compacted to a density of approximately ninety-five percent (95%) standard proctor to prevent harmful or unsightly settlement of the finished grade, but need not be tested for specific percentage of compaction.
- L Additional fill dirt shall be taken from on-site or off-site locations as agreed to by the Architect. Any such borrow areas shall be smoothed and left finished with topsoil, fertilizer and seeded as specified.

3.08 ROUGH GRADING:

- A Do all grading inside building to bring subgrade to proper level at underside of floor slab.
- B Do all grading outside the building required to bring the site to the finished grades indicated on the drawings. Subgrade in areas to be seeded and planted shall be brought to within 5" of finished grades.
- C Sub-grades under walks and paved areas shall be brought to proper elevations at bottom of surfacing material to within two-tenths of one foot, plus or minus, of the required grades and profiles.
- D Grades not otherwise shown shall be uniform levels or slopes between points where elevations are given, or between such points and existing finished grades.

3.09 EXCAVATION FOR UTILITY TRENCHES:

- A Excavate trenches to indicated gradients, lines, depths, and elevations.
  - 1. In the absence of a local code requirement or standard detail, beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B Excavate trenches to uniform widths to provide a working clearance on each side of pipe. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe, unless otherwise indicated.
  - 1. Clearance: As indicated in standard detail or 12" minimum on each side of pipe if no detail is available.
- C Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes. Remove projecting stones and sharp objects along trench subgrade.
  - 1. For ductile or cast iron pipe, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.

2. For PVC or other flexible pipe provide 6" bedding layer of #57 stone.
3. For all pipe, excavate trenches 6" deeper than elevation required in rock or other unyielding bearing material to allow for #57 stone bedding layer. Provide specified stone.

### 3.10 UTILITY TRENCH BACKFILL:

- A Place and compact bedding course on trench bottoms where indicated as fill area on plans. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- B Backfill trenches excavated under footings and within 18 inches of bottom of footings with concrete to elevation of bottom of footings.
- C Provide 4-inch-thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway sub-base.
- D For typical site installation of ductile or cast iron pipe, place and compact initial backfill of sub-base material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping to avoid damage or displacement of utility system. For PVC or other flexible pipe, backfill with #57 stone to 6" above top of pipe to provide complete stone envelope. Backfill to subgrade with #57 stone in all paved areas.
- E Coordinate backfilling with utilities testing.
- F Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.
- G Place and compact final backfill of satisfactory soil material to final sub grade.
- H Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### 3.11 FINE GRADING:

- A All areas where existing grass lawn cover is damaged or disturbed by construction operations. Areas indicated on the site plan to be grass shall be surfaced with topsoil not less than 5" thick after compacting. If the quantity of topsoil existing on the site is insufficient for these purposes, or if the existing topsoil does not conform to the requirements specified above for topsoil, additional topsoil shall be brought to the job or the existing topsoil shall be amended as required to provide the specified quantity and quality of topsoil.
- B After the rough grading and other construction operations have been completed to the point where these areas will not be disturbed by subsequent work, the subgrade shall be cleaned free from waste materials of all kinds, large rocks, and other objectionable material; scarified and pulverized to a depth of 4"; graded to remove remaining surface irregularities; and then covered with the topsoil which was previously removed and stockpiled.
- C If the previously stockpiled topsoil is not sufficient to cover the areas as specified, the Contractor shall furnish additional topsoil obtained from other sources. Topsoil obtained from other sources shall be clean, friable loam free from objectionable weed seeds.
- D Finished grades shall slope away from the building in all cases and shall contain no sinks or dams. Hand trim and rake topsoil to finished grades and leave ready for seeding or planting.

### 3.12 DISPOSAL OR SURPLUS MATERIAL AND VEGETATION:

- A Surplus dirt and rock not required for site improvements shall be removed from the site at the Contractor's expense and to a place of his choosing but only after the Architect has determined it cannot be used on the site. The Owner shall be given the opportunity to keep surplus dirt on site to use as he sees fit. Only after the Owner has stated that they do not wish to retain surplus dirt shall it be removed from the site.
- B All vegetation, roots, trees, etc., are to be hauled away from the site and disposed of by the Contractor and at his expense.
- C Placement of any materials listed in Paragraphs A & B above on any off-site location shall be done only after prior approval of the Owner of the land involved and it shall be the full responsibility of the Contractor and Owner of such land to agree on location, distribution and condition in which such materials are left.

End of Section

## SECTION 31 21 13 - RADON MITIGATION

### PART I - GENERAL

#### 1.01 SUMMARY:

- A Furnish all labor, materials, tools, equipment, supervision, coordination, services, etc., required for complete execution of Underground Passive System for Radon Protection as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

Section 31 20 00	Earthwork
Division 26	Electrical

- B EPA Radon Resistant New Construction Document EPA 402-95012 May 1995

- C ASTM E 1465-08a – “Standard Practice for Radon Control Options for the Design and Construction of New Low-Rise Residential Buildings”

#### 1.03 SUBMITTALS:

- A. Conform to all Submittal Requirements specified herein.
- B. Product Certificates: Certify that products of this section meet or exceed EPA requirements for a passive system.
- C. Qualification Data: For Installer of passive system for radon protection.
- D. Test Reports: Provide testing for the units pursuant to the current HUD Guidelines, 25% of ground floor units in each building, 10% of upper floor units in each building and each common area.
  - 1. Test units after construction to verify Radon level baseline. If units are above 4 pCi/L or more than provide an active system including inline fan.

#### 1.04 QUALITY ASSURANCE:

- A. Installer Qualifications: A specialist who is licensed according to regulations of authorities having jurisdiction to install underground passive systems for radon protection and products in jurisdiction where Project is located, and who employs workers trained and approved by system manufacturer to install manufacturer's products.
- B. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

#### 1.05 COORDINATION:

- A. Coordinate the installation of the passive units per building with size, location and installation of service utilities.
- B. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

#### 1.06 WARRANTY:

- A. Special Warranty: Manufacturer's standard form, signed by Applicator and Contractor certifying the work and material be free of defects and/or workmanship issues due to defective installation.

1. Warranty Period: **Five** years from date of Substantial Completion.

## PART II - PRODUCTS

### 2.01 MATERIALS:

- A. Provide material and accessories as required to provide an installation in accordance with ASTM E 1465-08a.
- B. PVC 3" Diameter Vent pipe: See passive details on drawings.
  1. Schedule 40
  2. 3" PVC "T" fitting
  3. Electrical Junction box for inline fan connection

## PART III - EXECUTION

### 3.01 EXAMINATION:

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site, earthwork, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION:

- A. Install in strict accordance with all requirements of ASTM E 1465-08a.
- B. All concrete slabs that come in contact with the ground shall be laid over a gas permeable material made up of either a minimum 6" thick uniform layer of clean aggregate sized greater than 1/4" and less than 2", overlain by a layer or strips of 6mil polyethylene sheeting designed to allow the lateral flow of soil gases.
  1. Seams shall be lapped a minimum of 12".
- B. All openings, gaps and joints in floor and wall assemblies in contact with soil or gaps around pipes, toilets, bathtubs or drains penetrating these assemblies shall be filled or closed with materials that provide a perminate air-tight seal. Seal large openings with non-shrink mortar, grouts or expanding foam sealants and smaller gaps with an elastomeric joint sealant, as defined in ASTM C920-B7.
- C. Provide a junction box for electrical connection to inline fan for active system connection. Also provide system failure notice for inline fan.
- D. Provide a 4' x 4' sump pit 8" deep at the vertical stack for the collection of radon gases at each stack.

### 3.03 CLEANING AND PROTECTION:

- A. Remove temporary protective coverings unless otherwise indicated in manufacturer's written installation instructions.
- B. On completion of installation, clean all areas and surfaces as recommended by manufacturer and in accordance with other cleaning procedures specified herein.
- C. Replace any parts or materials that have been damaged or have deteriorated beyond successful repair by touchup or similar minor repair procedures.

End of Section

## SECTION 313116 – TERMITE CONTROL

### 1PART I GENERAL:

#### 1.01 SCOPE:

- A Furnish all labor, materials, tools, equipment, supervision, coordination, services, etc., required for complete execution of soil treatment for termite control as specified herein.
- B Furnish all labor, materials, tools, equipment, supervision, coordination, services, etc., required for complete execution of borate treatment for existing structural wood members for termite control as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBMITTALS:

- A. Product Data: For termiticide and borate if required.
  - 1. Include the EPA-Registered Label for termiticide and borate products.
- B. Product Certificates: For termite control products, signed by product manufacturer.
- C. Qualification Data: For Installer of termite control products.
- D. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's record information, including the following:
  - 1. Date and time of application.
  - 2. Moisture content of soil before application.
  - 3. Brand name and manufacturer of termiticide.
  - 4. Quantity of undiluted termiticide used.
  - 5. Dilutions, methods, volumes, and rates of application used.
  - 6. Areas of application.
  - 7. Water source for application.
- E. Wood Treatment Application Report: After application of borate is completed, submit report for Owner's record information, including the following:
  - 1. Date and time of application.
  - 2. Brand name and manufacturer of borate.
  - 3. Quantity of undiluted borate used.
  - 4. Dilutions, methods, volumes, and rates of application used.
  - 5. Areas of application.

1.04 QUALITY ASSURANCE:

- A. Installer Qualifications: A specialist who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located, and who employs workers trained and approved by bait-station system manufacturer to install manufacturer's products.
- B. Regulatory Requirements: Formulate and apply termiticides according to the EPA-Registered Label.
- C. Source Limitations: Obtain termite control products from a single manufacturer for each product.

1.05 PROJECT CONDITIONS:

- A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with requirements of the EPA-Registered Label and requirements of authorities having jurisdiction.

1.06 COORDINATION:

- A. Coordinate soil treatment application with excavating, filling, grading, and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs before construction.
- B. Apply borate treatment after framing, sheathing, and exterior weather protection is completed but before electrical and mechanical systems are installed.

1.07 WARRANTY:

- A. Special Warranty: Manufacturer's standard form, signed by Applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.

- 1. Warranty Period: **Five** years from date of Substantial Completion.

1.08 MAINTENANCE SERVICE:

- A. Continuing Service: Beginning at Substantial Completion, provide 12 months' continuing service including monitoring, inspection, and re-treatment for occurrences of termite activity. Provide a standard continuing service agreement. State services, obligations, conditions, and terms for agreement period; and terms for future renewal options.

2PART II PRODUCTS

2.01 MANUFACTURERS:

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Termiticides:
    - a. Aventis Environmental Science USA LP; Termidor.
    - b. Bayer Corporation; Premise 75 / Centerfire 75 WSP.
    - c. Dow AgroSciences LLC; Dursban TC orEquity.
    - d. FMC Corporation, Agricultural Products Group; Talstar, Prevail FT, Torpedo.

- e. Syngenta; Demon TC.
- 2. Borates:
  - a. Nisus Corp.; Bora-Care, Jecta.
  - b. NovaGuard Technologies, Inc.; Armor-Guard, Shell-Guard.
  - c. U.S. Borax Inc.; Tim-Bor.

## 2.02 SOIL TREATMENT:

- A. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to product's EPA-Registered Label.

## 2.03 WOOD TREATMENT:

- A. Borate: Provide an EPA-registered borate complying with requirements of authorities having jurisdiction, in an aqueous solution for spray application and a gel solution for pressure injection, formulated to prevent termite infestation in wood. Provide quantity required for application at the label volume and rate for the maximum diffusible borate concentration allowed for each specific use, according to product's EPA-Registered Label.

## 3PART III EXECUTION

### 3.01 GENERAL:

- A Perform application only after excavation, filling and grading operations are completed except as otherwise required in construction operations.
- B Do not perform soil treatment to frozen or excessively wet soil, or during inclement weather.

### 3.02 EXAMINATION:

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control.
  - 1. Proceed with application only after unsatisfactory conditions have been corrected.

### 3.03 PREPARATION:

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparation before beginning application of termite control treatment. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations.
- B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended in writing by termiticide manufacturer.
  - 1. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.



3.04 APPLICATION, GENERAL:

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

3.05 APPLYING SOIL TREATMENT:

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute treatment evenly.
1. Slabs-on-Grade and Basement Slabs: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
  2. Foundations: Adjacent soil including soil along the entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating the slab, and around interior column footers, piers, and chimney bases; also along the entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
  3. Crawlspace: Soil under and adjacent to foundations as previously indicated. Treat adjacent areas including around entrance platform, porches, and equipment bases. Apply overall treatment only where attached concrete platform and porches are on fill or ground.
  4. Masonry: Treat voids.
  5. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.
- B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- D. Post warning signs in areas of application.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

3.06 APPLYING BORATE TREATMENT:

- A. Application: Mix wood treatment borate solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of borate, according to manufacturer's EPA-Registered Label, so that wood framing, sheathing, siding, and structural members subject to infestation receive treatment.
1. Framing and Sheathing: Apply borate solution by spray to bare wood for complete coverage.
  2. Wood Members Thicker Than 4 Inches (100 mm): Inject borate gel solution under pressure into holes of size and spacing required by manufacturer for treatment.

End of Section

## SECTION 32 92 00 – SEEDING

### PART I GENERAL

#### 1.01 SCOPE:

- A. The work covered by this Section consists of furnishing all labor, equipment and materials required to place seed, commercial fertilizer, agricultural limestone and mulch material, including seed bed preparation, harrowing, compacting and other placement operations on graded earthen areas as described herein and shown on the Drawings. In general, seeding operations shall be conducted on all barren areas not covered by structures or pavement; all cleared or grubbed areas which remain as finish grade surfaces; and on all existing turf areas which are disturbed by construction operations and which are to remain as finish grade surfaces.
- B. The General Contractor shall be responsible for placing all topsoil on the site to within finish grade. The Landscape Contractor shall be responsible for finish grading, seeding and other operations as herein specified.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 QUALITY ASSURANCE:

- A. Prior to seeding, the Contractor shall furnish to the Architect labels or certified laboratory reports showing the analysis and germination of the seed to be furnished. Acceptance of the seed test reports shall not relieve the Contractor of any responsibility or liability for furnishing seed meeting the requirements of this Section.

#### 1.04 PROJECT CONDITIONS:

- A. Protect existing utilities, paving and other facilities from damage caused by seeding operations.
- B. Perform seeding work only after grading and other work affecting ground surface has been completed.
- C. Restrict traffic from lawn areas until grass is established.
- D. Provide hose and lawn watering equipment as required.

#### 1.05 WARRANTY:

- A. Provide a uniform stand of grass until the end of the Warranty Period, which is a period of one year from Acceptance of Work by the Owner. Any areas which are designated by the Architect as being unacceptable shall be re-seeded as specified herein until an acceptable stand of grass is established.

### PART II PRODUCTS

#### 2.01 SEED:

- A. Seed shall be delivered in new bags or bags that are sound and labels in accordance with the U.S. Department of Agriculture Federal Seed Act.
- B. All seed shall be from the last crop available at the time of purchase and shall not be moldy, wet or otherwise damaged in transit or storage.

- C. Seed shall bear growers analysis testing to a 95% minimum purity and 90% minimum germination.
- D. Species, rate of seeding, fertilization and other requirements shall be as indicated on the drawings. If not indicated on the drawings, they shall be as shown in the seed requirements table:

SEED REQUIREMENTS TABLE  
(Rate per 1000 sq. ft.)

<u>Area</u>	<u>Seed Type</u>	<u>Seed Quantity</u>	<u>Fertilizer</u>	<u>Fertilizer Quantity</u>
Lawn Areas	Kentucky 31 Fescue	5 lbs.	10-10-10	40 lbs.

2.02 FERTILIZER:

- A. Container bags shall have the name and address of manufacturer, brand, name weight and chemical composition. Containers shall insure proper protection in handling, transporting and storing the fertilizer.

2.03 LIMING:

- A. Limestone shall be a pulverize limestone having a carbonate content of not less than 85% by weight. The limestone shall be crushed so that at least 85% of the material passes a No. 10 mesh screen and 50% passes No. 40 mesh screen. Apply at a rate of 135 lbs. per 1000 sq. ft.

2.04 MULCH:

- A. Mulch shall be one of the following used at the specified rate:

1. Wood Cellulose Fiber 1,500 lbs. per acre
2. Straw 4,000 lbs. per acre

2.05 WATER:

- A. Free of substance harmful to seed growth. Furnished by Contractor. Hoses or other methods of watering furnished by Contractor.

2.06 EROSION CONTROL BLANKET:

- A. Wood excelsior blanket reinforced with a photo-degradable plastic grid similar to Curlex Excelsior blanket by the American Excelsior Company or product meeting or exceeding the properties of such.

PART III EXECUTION

3.01 SEED BED PREPARATION:

- A. Before fertilizing and seeding, the surfaces shall be trimmed and worked to true line free from variation, bumps, ridges and depressions, and all foreign materials including roots, rocks and debris removed.
- B. The soil surface to be seeded shall be thoroughly cultivated to a minimum depth of 4 inches with a weighted disk, tiller or other equipment.
- C. If the prepared surface becomes eroded, compacted, or wet due to rain or other occurrence, the surface shall be re-cultivated prior to seeding.
- D. Ground preparation operations shall be preformed only when the ground is in a tillable and workable condition, as determined by the Architect.

- E. Allowance for settlement shall be made.

3.02 FERTILIZER AND LIMING:

- A. Following seed bed preparation, fertilizer and lime shall be incorporated at the rates specified herein in the top 2 inches of the soil by disking or other measure.
- B. Fertilizer need not be incorporated in the soil when hydro-seeding is used in seeding operations.

3.03 SEEDING:

- A. Examine finish surfaces, grades, topsoil quality and depth. Do not start seeding work until unsatisfactory conditions are corrected.
- B. Seed of the specified group shall be sown as soon as the seed bed preparation is complete. Do not seed during windy conditions.
- C. Seeds shall be uniformly sown by approved mechanical method, preferably a broadcast type spreader. Hydro-seeding is an acceptable method of distribution of seed and fertilizer.
- D. Immediately after sowing by mechanical means, the seed shall be lightly with soil covered by a cultipacker or roller.

3.04 MULCHING:

- A. All seeded areas shall be uniformly mulched in a continuous blanket immediately after seeding. Approximately twenty five percent (25%) of the ground surface shall be visible through the mulch blanket. Mulches shall be applied at the rates as specified herein.

3.05 WATERING:

- A. Contractor shall be responsible for watering the seeded areas until a satisfactory stand of grass is obtained. Watering shall be done with sprinklers in such a manner as not to cause excessive runoff or erosion.

3.06 INSTALLATION OF EROSION CONTROL BLANKET:

- A. Install erosion control blanket on all slopes steeper than 3 run to 1 rise. Install blanket after seed has been placed. Apply blankets vertically to slopes butt ends and sides. Fasten

3.07 HYDROSEEDING:

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
  - 1. Mix Slurry with non-asphaltic tackifier.
  - 2. Apply slurry uniformly to all areas to be seeded in a 1-step process. Apply mulch at the minimum rate of 1500lb per acre (16.5 kg per 100 sq. m) dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.08 MAINTENANCE:

- A. Contractor shall submit typewritten instructions (prior to acceptance) recommending procedures to be established by the Owner for the maintenance of lawns for one full year.

- B. Maintain seeded lawn areas, including watering, spot weeding, mowing, applications of herbicides, fungicides, insecticides, and re-seeding until a full, uniform stand of grass free of weeds, undesirable grass species, disease and insects is achieved and accepted by the Architect.
  - 1. Water daily to maintain adequate surface soil moisture for proper seed germination. Continue daily watering for not less than thirty (30) days. Thereafter apply 1/2" of water twice weekly until acceptance.
  - 2. Repair, rework and re-seed all areas that have washed out, are eroded, or do not catch.
  - 3. Mow lawn areas as soon as lawn top growth reaches a 3" height. Cut back to 2" in height. Repeat mowing as required to maintain specified height.
- C. Maintain seeded banks, ditches, medians and fields to the extent of establishment only. Re-grade and re-seed washed out or eroded areas as required until a suitable cover is established.

3.09 SUBSTANTIAL COMPLETION:

- A. An inspection of the seeded lawns will be made by the Architect upon request for Application of Substantial Completion by the Contractor
- B. Seeded areas will be acceptable provided all requirements, including maintenance have been complied with, and a healthy, uniform close stand of specified grass is established free of weeds, undesirable grass species, disease and insects.
- C. No individual lawn areas shall have bare spots or unacceptable cover totaling more than two percent (2%) of the individual areas, in areas requested to be inspected.

3.10 CLEANING:

- A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair damage resulting from seeding operations.

End of Section

## SECTION 32 93 00 – LANDSCAPING

### PART I GENERAL

#### 1.01 SCOPE:

- A This section includes furnishing all materials, equipment, and labor necessary for placement of topsoil in all planting areas including backfilling of curbs, walks, and around building, soil treatment; planting of trees, shrubs and vines; protection, maintenance, guarantee and replacement of plants. All existing landscaping to remain shall have weeds removed and shall be mulched.
- B Before commencing any work required by this section, the Landscape Contractor shall ascertain the location of all utilities, subsurface drainage and underground construction so that proper precautions may be taken not to disturb or damage any subsurface improvements. This Contractor will be held responsible for making, at his own expense, all repairs to damaged utilities resulting from the work hereunder.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 32 92 00 Seeding

#### 1.03 QUALITY ASSURANCE:

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.
1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
  2. Experience: Five years' experience in landscape installation in addition to requirements in Division 01 Section "Quality Requirements."
  3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
  4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
    - a. Certified Landscape Technician - Exterior, with installation specialty area(s), designated CLT-Exterior.
    - b. Certified Ornamental Landscape Professional, designated COLP.
- B General: Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.
- C Do not make substitutions. If specified landscape material is not obtainable, submit proof of non-availability from a minimum of six suppliers to the Designer, together with proposal for use of equivalent material.
- D Analysis and Standards: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at the site. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.
- E Topsoil: Before delivery of topsoil, furnish Designer with written statement giving location of properties which topsoil is to be obtained. Submit laboratory proof of minimum 5% organic matter content in topsoil.
- F Trees, Shrubs and Plants: Provide trees, shrubs and plants of quantity, size, genus, species and variety shown and scheduled for landscape work complying with the requirements of ANSI Z60.1

"American Standard for Nursery Stock", and American Association of Nurserymen Standards for Nursery Stock, current edition. Such standards will be considered as MINIMUM ACCEPTABLE and Contractor will be expected to provide plants which can be considered to have a quality which is higher than minimum acceptable.

- G Inspection: The designer may inspect trees and shrubs either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size and quality. Designer retains the right to further inspect trees and shrubs for size and condition of root ball, insects, injuries and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Rejected material must be immediately removed from the project site.

#### 1.04 SUBMITTALS:

- A Certification: Submit certificates of inspection as required by governmental agencies. Submit manufacturer's certified analysis for soil amendments and fertilizers.
- B Planting Schedule: submit proposed planting schedule, indicating dates for each type of landscape work during normal seasons for such work in area of site. Correlate with specified maintenance periods to provide maintenance from date of substantial completion. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.
- C Maintenance Instruction: Submit typewritten instructions recommending procedures to be established by Owner for maintenance of landscape work for one full year. Submit prior to expiration of required maintenance period.

#### 1.05 DELIVERY, STORAGE, AND HANDLING:

- A All plants shall be packed, transported and handled with the care necessary to insure protection from injury. Plants shall be handled by their root zones only. They must not be dropped, thrown or otherwise roughly handled. All broken or damaged root balls, damaged containers or injured plants shall be rejected.
- B Plants in transport shall be fastened and secured in a manner that does not damage plant. Plants shall be protected from freezing, overheating, or excessive transpiration. All plants must be transported in a closed or tarp-covered vehicle or an open vehicle traveling less than 35 miles per hour. Anti-desiccant is permitted if used according to manufacturer's direction. The use of such a product does not constitute protection from heat, cold or wind.
- C Interim Storage: Plants not installed immediately upon their arrival at the site shall be stored in the proper manner as follows:
  - 1. Balled and burlapped plants must be heeled in a trench which allows contact of roots to soil or mulch. Bare roots must be covered with a layer of mulch.
  - 2. All plants shall be protected from wind and excessive sun by the use of moist burlap or other such barrier. Roots shall never be exposed to freezing, excessive heat or harsh winds.
  - 3. Bare-root, balled and burlapped, and container plants shall be watered daily in hot weather and frequently during cold weather. Machine balled plants shall be kept moist but never waterlogged.

#### 1.06 PROJECT CONDITIONS:

- A Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- B Utilities: Determine the locations of underground and overhead utilities and perform work in a manner to avoid possible damage. Repair to utilities, if damaged, shall be the responsibility of the Contractor at his expense.
- C Report of Unfavorable Conditions: The Contractor shall notify the Designer of adverse soil drainage conditions, discrepancies in sub-grade elevations, or other situations unfavorable for Landscape

installation. He shall do no additional work, except at his own risk, in such an area until the problem has been reviewed by the Designer and resumption of work is authorized.

- D Report of Obstructions to Work: In the event that plants have been inadvertently located in the plan too close to a utility or other obstruction, the Contractor shall notify the Designer in order for relocations of plant material to be determined.
- E Protection of Site from Damage: The Contractor shall provide at his own expense, protection against trespassing and damage to seeded areas, planted areas and other construction areas until the Provisional Acceptance. He shall provide barricades, temporary fencing, signs, written warning or policing as may be required to protect such areas.
- F Protection and Replacement of Existing site Features: It shall be the Contractor's responsibility to locate and protect all existing above and below ground utilities. The Contractor shall be responsible for the protection of crowns, trunks and roots of existing trees, shrubs, lawns, paved areas, structures and other existing landscaped areas that are to remain.
  - 1. Existing trees which may be subject to construction damage shall be boxed, fenced or otherwise protected before any work is started. Boxing or other protection will be removed at the end of construction. Do not locate heavy equipment or stockpiles within the drip-line of existing plants, or on lawns.
- G Water: Water shall be clean, clear water free from objectionable or harmful chemical qualities or organisms. Contractor shall verify location of water on the site and shall make arrangements and furnish equipment to convey water to planted areas.

#### 1.07 GUARANTEE AND MAINTENANCE:

- A All plant material and other landscape work including lawns shall be guaranteed by the Contractor for a period of one year beginning on the date of Provisional Acceptance. Plant materials including trees, shrubs, grassed areas and perennials shall have acceptable appearance, be alive and healthy and exhibit vigorous normal growth. Upon notice by the Designer, the contractor shall replace, without cost to the Owner, and as soon as weather conditions permit, all unacceptable plants.
  - 1. Replacements shall match adjacent specimens of the same species and shall conform to the standards for plant materials specified. All replaced material shall immediately be removed from the site and all necessary repairs to plants, grades, lawn areas, paving, and other areas damaged during replacement shall be made at no cost to the Owner.
  - 2. When Work is provisionally accepted in parts, the guarantee period extends from each Provisional Acceptance date to the terminal date of the last Guarantee Period. Thus, all Guarantee Periods terminate at the same time.
  - 3. If the replacement is not acceptable during or at the end of the Guarantee Period, the Owner may elect either subsequent replacement or credit. Replacements shall have a similar one-year Guarantee from the date of replacement.
  - 4. Guarantee applies to losses other than those due to Acts of God, vandalism, or Owner neglect, as determined by the Owner.
- B Maintenance Period: Contractor shall provide all maintenance (including watering) for the landscape work (including grassing) during construction and for one year after Provisional Acceptance of the Work.

#### 1.08 INSPECTIONS:

- A Interim Inspections: Inspections will be made during the progress of the work to check compliance with the plans and specifications during construction.
- B Punch List Inspection: When work has been substantially completed, contractor shall notify the Designer that work is ready for Punch List Inspection. The Designer, within reasonable time, will check work and prepare Punch List stating observed deficiencies of work which need correction prior to Provisional Acceptance Inspection. Punch List is for Contractor's convenience and shall not relieve



him of any obligations of Contract. All items on the punch list shall have been attended to, prior to Provisional Acceptance Inspection(s).

- C Inspection for Provisional Acceptance of Work: Shall occur upon completion of final recommendations submitted by the Designer after the Punch List Inspection. Contractor shall notify the Designer 7 days in advance of anticipated date of the Provisional Acceptance Inspection. At this inspection all requirements on the Contract Documents must be satisfactorily completed. If work is unacceptable and additional inspection is required, Contractor shall reimburse Owner for additional expenses charged by the Designer for re-inspection and Owner shall deduct such amount from payment to Contractor
- D Inspection for Final Approval: To occur at end of Guarantee Period. At the end of the Guarantee period, the Designer will make a final inspection. Upon completion of all repairs or renewals which may appear at that time to be necessary, the Designer shall certify in writing to the Owner the Final Acceptance of the project.

## PART II PRODUCTS

### 2.01 SOIL:

- A Topsoil: Shall be natural, fertile, agricultural soil, capable of sustaining vigorous plant growth. It shall be of uniform friable clay loam composition throughout, without admixture of subsoil. Soil shall be free of stones, lumps, live plants and their roots, sticks and other extraneous matter. The soil shall not be contaminated with substances harmful to the growth of plants and humans. It shall have a pH range of 5.0 to 7.0, and contain not less than five percent (5%) organic matter. The topsoil shall be free of noxious weeds, grasses or other foreign vegetation which would cause maintenance problems for the Owner after the contract is complete. Contractor shall assume full responsibility for control of noxious species introduced by the addition of soil infested with such species for a period of one year from Provisional Acceptance of the Work.
- B Backfill soil: Shall consist of topsoil mixed with amendments as specified in the detail drawings.
- C Any stored topsoil remaining after all work is in place shall be disposed of by the Contractor.

### 2.02 SOIL AMENDMENTS:

- A Lime: Natural limestone containing not less than eighty five percent (85%) of total carbonates, ground so that not less than ninety percent (90%) passes a 10-mesh sieve and not less than fifty percent (50%) passes a 100-mesh sieve. Provide lime in the form of dolomitic limestone meeting the specified requirements. Do not apply lime in areas where acid-loving plants are installed.
- B Organic Amendments: Shall consist of finely milled black Michigan Peat or other organic compost approved by the Designer. See graphic details for application rate and method.
- C Superphosphate: Soluble mixture of treated minerals, 20% available phosphoric acid.
- D Sand: Clean, washed sand, free of toxic materials. Manufactured limestone sand is not acceptable. See graphic details for application rate and method.
- E Commercial Fertilizer: complete fertilizer of neutral character, with some elements derived from organic sources and containing following percentages of available plant nutrients:
  - 1. For trees and shrubs, provide fertilizer with not less than 10% total nitrogen, 10% available phosphoric acid and 10% soluble potash and including trace elements. The use of a slow release product is recommended. Apply per manufacturer's recommendations.

### 2.03 MULCHES:

- A Mulch shall be shredded hardwood bark unless otherwise specified on the materials list. Mulches shall be free from matured seed, noxious weeds, egg cases, harmful insects, or any species or

chemical detrimental to the development of plants and humans. contractor shall assume full responsibility for control of noxious weeds introduced on the site in the mulch for a period of one year after Provisional Acceptance of the Work. Mulches shall exhibit uniform texture, color and particle size. Submit sample for approval prior to placing mulch.

2.04 MATERIALS FOR PLANT SUPPORT AND PROTECTION:

- A Plants to be staked and acceptable methods of staking are described herein. Tree stakes and guy stakes shall be pressure treated pine with minimum uniform cross-section of 2 x 2 inches nominal dimension, capable of withstanding above ground and underground conditions until Final Acceptance. Metal tree anchors manufactured specifically for this purpose may be used.
- B Lumber lengths shall be as specified herein. Guy wires shall be of 12 gauge or comparable strength, malleable, galvanized annealed wire.
- C Wires shall not come in contact with plant, but shall be covered with rubber hosing at point of contact. Hosing shall be two-ply, 1/2 inch minimum diameter reinforced rubber hose or approved comparable, non-injurious product of a length sufficient to properly protect trunk.
- D Commercial tree wrapping product shall be of bituminous impregnated tape, heavy crepe paper, or other approved material 4 to 12 inches wide. Twine shall be not less than 2-ply jute twine or comparable non-metallic material of neat, inconspicuous appearance. Contractor shall submit samples of above materials for approval to Designer.
- E Weed Barrier Fabric: Provide black polypropylene sheet 28 mils thick, grab tensile strength per ASTM D-4632; 179LB (machine direction) 108 lbs (cross machine direction)

2.05 PLANT MATERIALS:

- A Plant List: A complete list of plants, including a schedule of quantities, sizes and other requirements, is shown on the drawings.
- B Quality: Plants shall have a habit of growth that is normal for the species and shall be sound, healthy and free from disease, insect pests, mechanical injuries, defects, disfiguring knots, abrasions of the bark, and sunscald injuries. Plants shall stand straight and plumb in their natural position and shall be heavily and well branched in the manner of any high quality specimen of its species. During the appropriate season, plants shall exhibit healthy and full foliage. All plants shall be nursery grown from stock that has proven hardy to the location of this project. Plants shall have been growing under similar climactic conditions as the location of this project.
- C Nomenclature: The names of plants required shall conform generally with names accepted in nursery trade, but authority in case of dispute shall be Standardized Plant Names, Second Edition, American Joint Committee on Horticultural Nomenclature, 1942, J. Horace McFarland Company, Harrisburg, Pennsylvania.
- D Measurement: Plant size, grading standards and methods of measurement shall conform to those of the American Standard For Nursery Stock, American Association of Nurserymen, 230 Southern Building Washington, D.C., 20005, 1980 unless otherwise specified. All plants shall be an approximate average between the minimum and maximum dimensions cited on the plant list including: stem height, caliper, average spread of foliage, root spread and minimum number of stems. A plant shall be measured before pruning as it stands in its natural position. Height and spread specified refer to the main body of the plant and not to the distance from tip to tip of branches or roots.
- E. Sod: Provide strongly rooted sod not less than 2 years old, free of weeds and undesirable native grasses and machine cut to pad thickness of 3/4" (+/- 1/4"), excluding top growth and thatch. Provide only sod capable of vigorous growth and development when planted (viable, not dormant).
- F. Provide sod of uniform pad sizes with maximum 5% deviation in either length or width. Broken pads or pads with uneven ends will not be acceptable. Sod pads incapable of supporting their own weight when suspended vertically with a firm grasp on upper 10% of pad will be rejected.

1. Provide sod as shown on the drawings.
2. Turfgrass Species: Sod of grass species as specified, with not less than 95% germination, not less than 85 percent pure seed, and not more than 0.5% weed seed:

PART III EXECUTION:

3.01 FINISH GRADING:

- A All areas where existing grass lawn cover is damaged or disturbed by construction operations areas indicated on the site plan to be grass shall be surfaced with topsoil not less than 5" thick after compacting
- B If the previously stockpiled topsoil is not sufficient to cover the areas as specified, the Contractor shall furnish additional topsoil obtained from other sources. Topsoil obtained from other sources shall be clean, friable loam free from objectionable weed seeds.
- C Finished grades shall slope away from the building in all cases and shall contain no sinks or dams. Hand trim and rake topsoil to finished grades and leave ready for seeding or planting.
- D Minimum permitted slope on site shall be 1.5% to insure positive drainage.

3.02 PREPARATION FOR PLANTING:

- A Layout and Staking: Layout individual tree and shrub locations and areas for mass plantings. Stake locations and outline areas and secure Designer's acceptance before start of planting work. Make minor adjustments as may be requested. Contractor shall immediately notify Designer if structural changes in paving or other site construction are different from the plans and would cause a change in the location of any plants.
- B Planting Pit and Bed Preparation: No plant pits shall be dug or prepared until their location is approved by the Designer. Holes for shrubs and trees shall be dug as shown on the planting details.
  1. Topsoil for backfilling shall be kept separate from excavated subsoil. Excess subsoil from planting areas shall kept separate from excavated subsoil. Excess subsoil from planting areas shall be removed from the site unless otherwise directed.
  2. All existing sod remaining in areas shown to be planted, shall be sprayed, stripped and removed from the site. Following manufacturer's recommendations, especially with regard to temperature, rainfall, etc. Spray sod with Round-up or comparable systemic herbicide at least seven days prior to beginning work. If Bermuda grass is present, make at least two such applications in appropriate season prior to stripping sod. Upon beginning work, strip all sod to a depth of at least 2" and remove sod from site unless otherwise directed by the Owner.
  3. Shrub masses may be planted in beds rather than individual holes. Beds shall be evenly tilled to a depth of six inches. Organic matter, fertilizers and herbicides shall be evenly incorporated into those six inches. The soil shall then be raked smooth to an even grade allowing for adequate surface drainage prior to being covered with mulch as indicated on the details. Install weed barrier fabric over soil prior to planting shrubs. Make an "X" cut in the fabric at each plant location and fold back the tabs to allow the shrub to be planted. After planting and before mulch is spread, fold tabs of cut back into place.
  4. All plant beds shall be treated with Ronstar-G or comparable pre-emergent herbicide on the bare soil prior to placing mulch and on top of the mulch after it is in place. Apply per manufacturer's instructions.
- C Root and Ball Preparation: All plant material root balls shall receive the following treatment:
  1. Prior to planting, container grown material shall have containers removed. If root bound, container plants shall have their exterior root mass sliced vertically three times or appropriately loosened in an acceptable manner.
  2. Any non-decomposable twine or containers shall be removed from any plant prior to backfilling. Non-decomposable burlap must be either removed from the root ball after

placement in the hole or rolled under the root ball as far as possible from the surface. Any damaged roots shall be pruned back according to acceptable horticultural practices.

3. The Contractor shall be responsible for the removal and control of any weeds growing in the soil or any container grown or balled and burlapped plants which are used on this project.

### 3.03 SETTING PLANTS:

- A Backfill in bottom of pit shall be lightly tamped or settled by watering prior to setting plants. Each plant shall be placed in the center of the planting hole in a vertically plumb position. Plants shall be rotated to obtain the best visual appearance and proper relationship to nearby buildings or adjacent plants. Sufficient backfill should be placed in the bottom of the hole so that the plant sits at the same grade or no more than two inches above the grade that it rested in the field. The roots of bare root plants, pruned appropriately, shall be spread out to their approximate natural position over a cone or mound of soil formed in the center of the planting pit. Balled and burlapped plants shall be set straight in the hole while still in their wrapped ball.
- B Backfilling and Backfill Content: Backfill shall consist of topsoil plus peat moss at a ratio of 3:1, respectively. The plant pit shall be backfilled in layers around the roots or ball. Each layer shall be carefully worked around loose roots and lightly settled in place in such a manner as to avoid injury to the roots or ball and to avoid disturbing the position of the plant. When approximately two-thirds of the plant hole has been backfilled: 1) the balled and burlapped plants shall have the top third of the burlap cut away or folded back, 2) All plant pits shall be filled with water and allowed to settle. After water has settled, backfill with specified topsoil mixture and tamp lightly to grade.
- C Watering: Immediately after planting, the entire planting pit area and root mass shall be soaked with contaminant free water again and any erosion caused by watering repaired. All plants shall be watered by the Contractor as required during the maintenance period.
- D Mulching: After the water has been absorbed and any settlement has been brought to grade, a 2-3 inch layer of mulch shall be spread around the base of the plant. As pictured on the planting details, construct a 4 inch saucer of mulch around the plant pit.
- E Pruning: The bruised or broken parts of large or fleshy roots be cut off smooth before planting. The tops of deciduous plants shall be pruned wither immediately before or after planting. This shall consist of removing 1/4 to 1/3 of the top or thinning out and/or heading back the stems and top branches, and shall be done so that the plant retains its natural form. All pruning shall be done in accordance with standard horticultural practices. Only the proper sharp, clean tools shall be used. The top leader of any tree shall never be pruned unless previously approved by the Designer. All cuts shall be made close to the trunk or branch except when heading back. When heading back, cuts shall be made just above a viable bud. Evergreen plants shall not be pruned except to remove dead or broken branches unless otherwise indicated in the drawings. All cut surfaces one inch or more in diameter shall be painted with a standard non-toxic tree wound dressing.
- F Staking: All trees over 6' in height and up to 2" caliper shall be staked in the following manner:
  1. Use 2 parallel stakes driven 18" into firm soil about 1 foot beyond planting hole. The height of the stakes shall be two-thirds that of the tree after being driven into the ground.
  2. The tree is then supported by wires attached to both stakes and looped around trees. Rubber hosing should be used to protect trees.
- G Guying: All trees over a 2" caliper shall be guyed in the following manner:
  1. Stakes are driven into the ground 18" - 30" at a 45 degree angle away from the tree trunk and notched to hold the wire secure. The distance from the tree trunk to the stake is approximately the same as the height of the tree.
  2. The wire is then fastened two-thirds of the way up the trunk by a loose rubber-hose-covered loop. The other end is fastened to the stake.
  3. Tighten wire by twisting wire with a small stick or install turnbuckles if necessary.

H Bed Preparation (Annuals and Groundcovers): The soil for planting beds shall consist of a minimum of 4 inches of topsoil and peat moss in the ratio of 3:1, respectively. Beds shall be evenly tilled, raked to a level grade, and then mulched prior to planting.

1. Plant Preparation: Plants shall be thoroughly soaked with water before planting. Care should be taken to handle plants by their roots. All containerized plants shall have their containers removed and their soil/root mass loosened.
2. Setting Plants: Place plants at even spacing according to the plantings details. Bulbs, tubers, or other below ground root structures shall be placed at a proper depth according to standard horticultural practices.
3. Watering: Immediately after planting, plants shall be thoroughly watered with a diffusing type applicator such as a sprinkler. Water shall be uncontaminated. Contractor shall be responsible for watering until the end of the maintenance period.

3.04 SODDING:

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
1. Lay sod across angle of slopes exceeding 1:3.
  2. Anchor sod on slopes exceeding 1:6 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.
  3. Saturate sod with fine water spray within two hours of planting. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below sod.

3.05 MAINTENANCE:

- A Begin maintenance immediately after planting.
- B Maintain trees, shrubs, and other plants until after final acceptance but in no case less than the following period: 60 days after substantial completion of planting.
- C Maintain trees, shrubs, and other plants by pruning, cultivating and weeding as required for healthy growth. Restore planting saucers. Tighten and repair stake and or vertical position as required. Restore or replace damaged wrappings. Spray as required to keep trees and shrubs free of insects and disease.

3.06 CLEAN UP:

- A Clean Up and Restoration of Damaged Areas: During planting, excess and waste materials shall be continuously and promptly removed, lawn areas and paved surfaces kept clear and all reasonable precautions shall be taken to avoid damage to existing structures, plants and grass. Prior to Acceptance of Work, all damaged areas must be restored with the same quality of work as required in these specifications. All debris, waste material, excess soil etc. shall be removed. Walks and paved areas shall be hosed down and scrubbed clean, and the entire site made neat. Contractor shall provide barricades, signage, etc. as is prudently necessary to prevent pedestrian or vehicular accidents which could occur as a result of the Contract work.

End of Section

## SECTION 33 10 00 – WATER DISTRIBUTION

### PART I GENERAL:

#### 1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY:

- A. This Section includes water-distribution piping and specialties outside the building for the following:
  - 1. Water services.
  - 2. Combined water service and fire-service mains.
  - 3. Utility-furnished products include water meters that will be furnished to the site, ready for installation.

#### 1.03 DEFINITIONS:

- A. Combined Water Service and Fire-Service Main: Exterior water piping for both domestic-water and fire-suppression piping.
- B. Water Service: Exterior domestic-water piping.
- C. The following are industry abbreviations for plastic materials:
  - 1. PVC: Polyvinyl chloride plastic.

#### 1.04 SUBMITTALS:

- A. Product Data: For the following:
  - 1. Pipe materials and fittings
  - 2. Piping specialties.
  - 3. Valves and accessories.
  - 4. Water meters and accessories.
  - 5. Backflow preventers and assemblies.
  - 6. Protective enclosures.
  - 7. Fire hydrants.
  - 8. Flushing hydrants.
  - 9. Post hydrants.
- B. Shop Drawings: For the following:
  - 1. Precast concrete vaults, including frames and covers, ladders, and drains.
  - 2. Wiring Diagrams: Power, signal, and control wiring.
- C. Coordination Drawings: For piping and specialties including relation to other services in same area. Show piping and specialty sizes and valves, meter and specialty locations, and elevations.
- D. Field Quality-Control Test Reports: From Contractor.
- E. Operation and Maintenance Data: For specialties to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section 01300,"Submittals" include the following:
  - 1. Water meters.

2. Valves.
3. Backflow preventers.
4. Protective enclosures.
5. Fire hydrants.
6. Flushing hydrants.
7. Post hydrants.

1.05 QUALITY ASSURANCE:

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of piping and specialties and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
- B. Regulatory Requirements:
  1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
  2. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.
  3. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- C. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- D. 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.
- E. Comply with ASTM F 645 for selection, design, and installation of thermoplastic water piping.
- F. Comply with FM's "Approval Guide" or UL's "Fire Protection Equipment Directory" for fire-service-main products.
- G. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.
- H. NSF Compliance:
  1. Comply with NSF 14 for plastic potable-water-service piping. Include marking "NSF-pw" on piping.
  2. Comply with NSF 61 for materials for water-service piping and specialties for domestic water.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:
  1. Ensure that valves are dry and internally protected against rust and corrosion.
  2. Protect valves against damage to threaded ends and flange faces.
  3. Set valves in best position for handling. Set valves closed to prevent rattling.
- B. During Storage: Use precautions for valves, including fire hydrants, according to the following:
  1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
  2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

- C. Handling: Use sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
- D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.07 PROJECT CONDITIONS:

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Architect's written permission.

1.08 COORDINATION:

- A. Coordinate connection to water main with utility company.

PART II PRODUCTS

2.01 MANUFACTURERS:

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
  - 2. Products: Subject to compliance with requirements, provide one of the products specified.
  - 3. 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.
  - 4. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.02 PIPING MATERIALS:

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

2.03 DUCTILE-IRON PIPE AND FITTINGS:

- A. Push-on-Joint, Ductile-Iron Pipe: AWWA C151, with push-on-joint, bell- and plain-spigot end unless grooved or flanged ends are indicated.
  - 1. Push-on-Joint, Ductile-Iron Fittings: AWWA C153, ductile-iron compact pattern.
    - a. Gaskets: AWWA C111, rubber.



- B. Ductile-Iron Expansion Joints: Three-piece, ductile-iron assembly consisting of telescoping sleeve with gaskets and restrained-type, ductile-iron, bell-and-spigot end sections complying with AWWA C110 or AWWA C153. Select and assemble components for expansion indicated. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.

#### 2.04 COPPER TUBE AND FITTINGS:

- A. Soft Copper Tube: ASTM B 88, Type K (ASTM B 88M, Type A), water tube, annealed temper.
  - 1. Copper Fittings: ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings.
- B. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end. Furnish Class 300 flanges if required to match piping.
- C. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

#### 2.05 PVC PIPE AND FITTINGS

- A. PVC, Schedule 40 Pipe: ASTM D 1785.
  - 1. PVC, Schedule 40 Socket Fittings: ASTM D 2466.
- B. PVC, AWWA Pipe: AWWA C900, Class 200, with bell end with gasket, and with spigot end.
  - 1. Comply with UL 1285 for fire-service mains if indicated.
  - 2. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
    - a. Gaskets: AWWA C111, rubber.
  - 3. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

#### 2.06 JOINING MATERIALS:

- A. Refer to Division 2 Section "Utility Materials" for commonly used joining materials.
- B. Transition Couplings:
  - 1. Underground Piping, NPS 1-1/2 (DN 40) and Smaller: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
  - 2. Underground Piping, NPS 2 (DN 50) and Larger: AWWA C219, metal, sleeve-type coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
  - 3. Aboveground or Vault Piping: Pipe fitting same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
- C. Brazing Filler Metals: AWS A5.8, BCuP Series.
- D. Soldering Flux: ASTM B 813, water-flushable type.
- E. Solder Filler Metal: ASTM B 32, lead-free type with 0.20 percent maximum lead content.
- F. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

## 2.07 PIPING SPECIALTIES:

### A. Flexible Connectors:

1. Nonferrous-Metal Piping: Bronze hose covered with bronze wire braid; with copper-tube, pressure-type, solder-joint ends or bronze flanged ends brazed to hose.
2. Ferrous Piping: Stainless-steel hose covered with stainless-steel wire braid; with ASME B1.20.1, threaded steel pipe nipples or ASME B16.5, steel pipe flanges welded to hose.

### B. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

### C. Tubular-Sleeve Pipe Couplings:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Cascade Waterworks Manufacturing.
  - b. Dresser, Inc.; Dresser Piping Specialties.
  - c. Ford Meter Box Company, Inc. (The); Pipe Products Div.
  - d. Hays Fluid Controls; a division of ROMAC Industries Inc.
  - e. JCM Industries.
  - f. Smith-Blair, Inc.
  - g. Viking Johnson.
2. Description: Metal, bolted, sleeve-type, reducing or transition coupling, with center sleeve, gaskets, end rings, and bolt fasteners and with ends of same sizes as piping to be joined.
  - a. Standard: AWWA C219.
  - b. Center-Sleeve Material: Manufacturer's standard.
  - c. Gasket Material: Natural or synthetic rubber.
  - d. Pressure Rating: 200 psig (1380 kPa) minimum.
  - e. Metal Component Finish: Corrosion-resistant coating or material.

### D. Split-Sleeve Pipe Couplings:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Victaulic Depend-O-Lok.
2. Description: Metal, bolted, split-sleeve-type, reducing or transition coupling with sealing pad and closure plates, O-ring gaskets, and bolt fasteners.
  - a. Standard: AWWA C219.
  - b. Sleeve Material: Manufacturer's standard.
  - c. Sleeve Dimensions: Of thickness and width required to provide pressure rating.
  - d. Gasket Material: O-rings made of EPDM rubber, unless otherwise indicated.
  - e. Pressure Rating: 200 psig (1380 kPa) minimum.
  - f. Metal Component Finish: Corrosion-resistant coating or material.

### E. Dielectric Fittings:

1. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
2. Dielectric Unions:
  - a. Description:
    - i. Standard: ASSE 1079.
    - ii. Pressure Rating: 250 psig (1725 kPa).
    - iii. End Connections: Solder-joint copper alloy and threaded ferrous.
3. Dielectric Flanges:
  - a. Description:
    - i. Standard: ASSE 1079.
    - ii. Factory-fabricated, bolted, companion-flange assembly.
    - iii. Pressure Rating: 300 psig (2070 kPa).
    - iv. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
4. Dielectric-Flange Insulating Kits:
  - a. Description:
    - i. Nonconducting materials for field assembly of companion flanges.
    - ii. Pressure Rating: 150 psig (1035 kPa).
    - iii. Gasket: Neoprene or phenolic.
    - iv. Bolt Sleeves: Phenolic or polyethylene.
    - v. Washers: Phenolic with steel backing washers.
5. Dielectric Nipples:
  - a. Description:
    - i. Standard: IAPMO PS 66
    - ii. Electroplated steel nipple. complying with ASTM F 1545.
    - iii. Pressure Rating: 300 psig (2070 kPa) at 225 deg F (107 deg C).
    - iv. End Connections: Male threaded or grooved.
    - v. Lining: Inert and noncorrosive, propylene.

## 2.08 CORROSION-PROTECTION ENCASEMENT FOR PIPING:

- A. Encasement for Underground Metal Piping: ASTM A 674 or AWWA C105, PE film, 0.008-inch (0.20-mm) minimum thickness, tube or sheet.

## 2.09 GATE VALVES:

- A. AWWA, Cast-Iron Gate Valves:

1. Available Manufacturers:
  - a. American AVK Co.; Valves & Fittings Div.
  - b. American Cast Iron Pipe Co.; American Flow Control Div.
  - c. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
  - d. Crane Co.; Crane Valve Group; Stockham Div.
  - e. East Jordan Iron Works, Inc.
  - f. Grinnell Corporation; Mueller Co.; Water Products Div.
  - g. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
  - h. McWane, Inc.; Kennedy Valve Div.
  - i. McWane, Inc.; Tyler Pipe; Utilities Div.
  - j. NIBCO INC.
  - k. United States Pipe and Foundry Company.
2. Nonrising-Stem, Resilient-Seated Gate Valves: AWWA C509, gray- or ductile-iron body and bonnet; with bronze or gray- or ductile-iron gate, resilient seats, bronze stem, and stem nut.

- a. Minimum Working Pressure: 200 psig (1380 kPa).
  - b. End Connections: Mechanical joint.
  - c. Interior Coating: Complying with AWWA C550.
- 3. OS&Y, Rising-Stem, Resilient-Seated Gate Valves:
  - a. Description: Cast- or ductile-iron body and bonnet, with bronze or gray- or ductile-iron gate, resilient seats, and bronze stem.
    - i. Standard: AWWA C509.
    - ii. Minimum Pressure Rating: 200 psig (1380 kPa).
    - iii. End Connections: Flanged.

## 2.10 GATE VALVE ACCESSORIES AND SPECIALTIES:

- A. Tapping-Sleeve Assemblies: Comply with MSS SP-60. Include sleeve and valve compatible with drilling machine.
  - 1. Available Manufacturers:
    - a. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
    - b. East Jordan Iron Works, Inc.
    - c. Grinnell Corporation; Mueller Co.; Water Products Div.
    - d. International Piping Services Company.
    - e. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
    - f. McWane, Inc.; Kennedy Valve Div.
    - g. McWane, Inc.; M & H Valve Company Div.
    - h. United States Pipe and Foundry Company.
  - 2. Tapping Sleeve: Ductile-iron two-piece bolted sleeve with flanged outlet for new branch connection. Include sleeve matching size and type of pipe material being tapped and with recessed flange for branch valve.
  - 3. Valve: AWWA, cast-iron, nonrising-stem, resilient-seated gate valve with one raised face flange mating tapping-sleeve flange.
- B. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," bottom section with base of size to fit over valve, and approximately 5-inch- (125-mm-) diameter barrel.
  - 1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.

## 2.11 CORPORATION VALVES AND CURB VALVES:

- A. Available Manufacturers:
  - 1. Amcast Industrial Corporation; Lee Brass Co.
  - 2. Ford Meter Box Company, Inc. (The).
  - 3. Grinnell Corporation; Mueller Co.; Water Products Div.
  - 4. Jones, James Company.
  - 5. Master Meter, Inc.
  - 6. McDonald, A. Y. Mfg. Co.
  - 7. Red Hed Manufacturing Co.
- B. Service-Saddle Assemblies: Comply with AWWA C800. Include saddle and valve compatible with tapping machine.

1. Service Saddle: Copper alloy with seal and AWWA C800, threaded outlet for corporation valve.
2. Corporation Valve: Bronze body and ground-key plug, with AWWA C800, threaded inlet and outlet matching service piping material.
3. Manifold: Copper fitting with two to four inlets as required, with ends matching corporation valves and outlet matching service piping material.

#### 2.12 WATER METERS:

- A. Water meters will be furnished by utility company.
- B. Description: AWWA C700, displacement-type, bronze main case. Register flow in gallons unless cubic feet are indicated.

#### 2.13 WATER-METER BOXES:

- A. Description: Cast-iron body and cover for disc-type water meter with lettering "WATER METER" in cover; and slotted, open-bottom base section of length to fit over service piping.
  1. Option: Base section may be cast-iron, PVC, clay, or other pipe.
- B. Description: For traffic areas - Polymer-concrete body and cover for disc-type water meter with lettering "WATER" in cover; and slotted, open-bottom base section of length to fit over service piping. Include vertical and lateral design loadings of 15,000 lb. minimum over 10 by 10 inches (6800 kg minimum over 254 by 254 mm) square.

#### 2.14 BACKFLOW PREVENTERS:

- A. Reduced-Pressure-Principle Backflow Preventers:
  1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
    - a. Ames Fire & Waterworks; a division of Watts Regulator Co.
    - b. Conbraco Industries, Inc.
    - c. FEBCO; SPX Valves & Controls.
    - d. Flomatic Corporation.
    - e. Watts Water Technologies, Inc.
    - f. Wilkins; a Zurn company.
  2. Standard: AWWA C511.
  3. Operation: Continuous-pressure applications.
  4. Pressure Loss: 12 psig (83 kPa) maximum, through middle 1/3 of flow range.
  5. Size: Per utility plan.
  6. Body: Bronze for NPS 2 (DN 50) and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved stainless steel for NPS 2-1/2 (DN 65) and larger.
  7. End Connections: Threaded for NPS 2 (DN 50) and smaller; flanged for NPS 2-1/2 (DN 65) and larger.
  8. Configuration: Designed for vertical inlet, horizontal center section, and vertical outlet flow.
  9. Accessories:
    - a. Valves: Ball type with threaded ends on inlet and outlet of NPS 2 (DN 50) and smaller; OS&Y gate type with flanged ends on inlet and outlet of NPS 2-1/2 (DN 65) and larger.
    - b. Air-Gap Fitting: ASME A112.1.2, matching backflow preventer connection.
- B. Double-Check, Backflow-Prevention Assemblies:

1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
  - a. Ames Fire & Waterworks; a division of Watts Regulator Co.
  - b. Conbraco Industries, Inc.
  - c. FEBCO; SPX Valves & Controls.
  - d. Flomatic Corporation.
  - e. Watts Water Technologies, Inc.
  - f. Wilkins; a Zurn company.
2. Standard: AWWA C510.
3. Operation: Continuous-pressure applications, unless otherwise indicated.
4. Pressure Loss: 5 psig (35 kPa) maximum, through middle 1/3 of flow range.
5. Size: Per utility plan.
6. Body: Bronze for NPS 2 (DN 50) and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved stainless steel for NPS 2-1/2 (DN 65) and larger.
7. End Connections: Threaded for NPS 2 (DN 50) and smaller; flanged for NPS 2-1/2 (DN 65) and larger.
8. Configuration: Designed for horizontal, straight through flow.
9. Accessories: Ball valves with threaded ends on inlet and outlet of NPS 2 (DN 50) and smaller; OS&Y gate valves with flanged ends on inlet and outlet of NPS 2-1/2 (DN 65) and larger.

C. Backflow Preventer Test Kits:

1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
  - a. Conbraco Industries, Inc.
  - b. FEBCO; SPX Valves & Controls.
  - c. Flomatic Corporation.
  - d. Watts Water Technologies, Inc.
  - e. Wilkins; a Zurn company.
2. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

2.15 CONCRETE VAULTS:

- A. Description: Precast, reinforced-concrete vault, designed for A-16 load designation according to ASTM C 857 and made according to ASTM C 858.
- B. Ladder: ASTM A 36/A 36M, steel or polyethylene-encased steel steps.
- C. Manhole: ASTM A 48, Class No. 35 (ASTM A 48M, Class No. 250) minimum tensile strength, gray-iron traffic frame and cover.
  1. Dimensions: Not smaller than 24-inch (610-mm) diameter, unless otherwise indicated.
- D. Drain: ASME A112.21.1M, cast-iron floor drain with outlet of size indicated. Include body anchor flange, light-duty cast-iron grate, bottom outlet, and integral or field-installed clapper-type backwater valve.

2.16 PROTECTIVE ENCLOSURES:

- A. Available Manufacturers:
  1. G&C Enclosures, Inc.
  2. Hot Box, Inc.
  3. HydroCowl, Inc.
  4. Watts Industries, Inc.; Water Products Div.

- B. Freeze-Protection Enclosures: Insulated and with heat source to maintain minimum internal temperature of 40° F (4° C) when external temperatures reach as low as minus 34° F (minus 36° C).
1. Class I: For equipment or devices other than pressure or atmospheric vacuum breakers.
  2. Class I-V: For pressure or atmospheric vacuum breaker equipment or devices. Include drain opening in housing.
    - a. Housing: Reinforced -fiberglass construction.
      - i. Drain opening for units with drain connection.
      - ii. Access doors with locking devices.
      - iii. Insulation inside housing.
      - iv. Anchoring devices for attaching housing to concrete base.
  3. Electric heating cable or heater with self-limiting temperature control.
- C. Precast concrete base of dimensions required to extend at least 6 inches (150 mm) beyond edges of enclosure housings. Include openings for piping.

#### 2.17 FREESTANDING FIRE HYDRANTS:

- A. Dry-Barrel, High-Pressure Fire Hydrants: AWWA C502, one NPS 4-1/2 (DN 115) and two NPS 2-1/2 (DN 65) outlets, 5-1/4 inch (133 mm) main valve, drain valve, and NPS 6 (DN 150) mechanical-joint inlet. Include interior coating according to AWWA C550. Hydrant shall have cast-iron body, compression-type valve opening against pressure and closing with pressure, and 250-psig (1725-kPa) minimum working-pressure design.
1. Available Manufacturers:
    - a. American AVK Co.; Valves & Fittings Div.
    - b. American Cast Iron Pipe Co.; American Flow Control Div.
    - c. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
    - d. American Foundry Group, Inc.
    - e. East Jordan Iron Works, Inc.
    - f. Grinnell Corporation; Mueller Co.; Water Products Div.
    - g. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
    - h. McWane, Inc.; Kennedy Valve Div.
    - i. McWane, Inc.; M & H Valve Company Div.
    - j. Troy Valve.
    - k. United States Pipe and Foundry Company.
  2. Outlet Threads: NFPA 1963, with external hose thread used by local fire department. Include cast-iron caps with steel chains.
  3. Operating and Cap Nuts: Pentagon, 1-1/2 inches (40 mm) point to flat.
  4. Direction of Opening: Open hydrant valve by turning operating nut to left or counterclockwise.
  5. Exterior Finish: Red alkyd-gloss enamel paint, unless otherwise indicated. Verify color requirements with jurisdiction having authority.

#### 2.18 FIRE DEPARTMENT CONNECTIONS

- A. Fire Department Connections:

1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
  - a. Elkhart Brass Mfg. Co., Inc.
  - b. Fire End & Croker Corporation.
  - c. Guardian Fire Equipment, Inc.
  - d. Kidde Fire Fighting.
  - e. Potter Roemer.
  - f. Reliable Automatic Sprinkler Co., Inc.
2. Description: Freestanding, with cast-bronze body, thread inlets according to NFPA 1963 and matching local fire department hose threads, and threaded bottom outlet. Include lugged caps, gaskets, and chains; lugged swivel connection and drop clapper for each hose-connection inlet; 18-inch- (460-mm-) high brass sleeve; and round escutcheon plate.
  - a. Standard: UL 405.
  - b. Connections: Two NPS 2-1/2 (DN 65) inlets and one NPS 4 (DN 100) outlet.
  - c. Inlet Alignment: Inline, horizontal.
  - d. Finish Including Sleeve: Polished bronze.
  - e. Escutcheon Plate Marking: "AUTO SPKR."

## 2.19 ALARM DEVICES

- A. Alarm Devices, General: UL 753 and FMG approved, of types and sizes to mate and match piping and equipment.
- B. Supervisory Switches: Single pole, double throw; designed to signal valve in other than fully open position.

## PART III EXECUTION

### 3.01 EARTHWORK:

- A. Refer to Division 31 Section for excavating, trenching, and backfilling.

### 3.02 PIPING APPLICATIONS:

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.
- B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.
- C. Do not use flanges, unions, or keyed couplings for underground piping.
- D. Flanges, unions, keyed couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.
- E. Underground Water-Service Piping NPS ¾ to NPS 3. Use the following piping materials for each size range unless otherwise indicated on the drawings:
  1. Soft copper tube, ASTM B 88, Type K (ASTM B 88M, Type A); wrought-copper, solder-joint fittings; and brazed joints; or
  2. PVC, Schedule 40 pipe; PVC, Schedule 40 socket fittings; and solvent-cemented joints.
- F. Underground water-service piping NPS 4 to NPS 8. Use the following piping materials for each size range unless otherwise indicated on the drawings:



1. Ductile-iron, push-on-joint pipe; ductile-iron, push-on-joint fittings; and gasketed mechanical-joint pipe; ductile-iron, mechanical-joint fittings; and mechanical joints; or
  2. PVC, AWWA Class 200 pipe; mechanical-joint, ductile-iron fittings; and gasketed joints.
- G. Water Meter Box Water-Service Piping NPS 3/4 to NPS 3 shall be same as underground water-service piping.
- H. Underground Fire-Service-Main Piping NPS 4 to NPS 12. Use the following piping materials for each size range unless otherwise indicated on the drawings:
1. Ductile-iron, push-on-joint pipe; ductile-iron, push-on-joint fittings; and gasketed mechanical-joint pipe; ductile-iron, mechanical-joint fittings; and mechanical joints; or
  2. PVC, AWWA Class 200 pipe listed for fire-protection service; mechanical-joint, ductile-iron fittings; and gasketed joints.
- I. Underground Combined Water-Service and Fire-Service-Main Piping NPS 6 to NPS 12. Use the following piping materials for each size range unless otherwise indicated on the drawings:
1. Ductile-iron, push-on-joint pipe; ductile-iron, push-on-joint fittings; and gasketed mechanical-joint pipe; ductile-iron, mechanical-joint fittings; and mechanical joints.
  2. PVC, AWWA Class 200 pipe listed for fire-protection service; mechanical-joint, ductile-iron fittings; and gasketed joints.

### 3.03 VALVE APPLICATIONS:

- A. General Application: Use mechanical-joint-end valves for NPS 3 (DN 80) and larger underground installation. Use flanged-end valves for installation in vaults. Use UL/FM, nonrising-stem gate valves for installation with indicator posts. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 (DN 50) and smaller installation.
- B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
1. Underground Valves, NPS 3 (DN 80) and Larger: AWWA, cast-iron, nonrising-stem, resilient seated gate valves with valve box.

### 3.04 JOINT CONSTRUCTION:

- A. Make pipe joints according to the following:
1. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
  2. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.
  3. Copper Tubing Soldered Joints: ASTM B 828. Use flushable flux and lead-free solder.
  4. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139 and pipe manufacturer's written instructions.
  5. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with OD, and with system working pressure. Refer to Division 2 Section "Utility Materials" for joining piping of dissimilar metals.

### 3.05 PIPING INSTALLATION:

- A. Water-Main Connection: Arrange with utility company for tap of size and in location indicated in water main.

- B. Water-Main Connection: Tap water main according to requirements of water utility company and of size and in location indicated.
- C. Make connections larger than NPS 2 (DN 50) with tapping machine according to the following:
  - 1. Install tapping sleeve and tapping valve according to MSS SP-60.
  - 2. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.
  - 3. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove tapping machine and connect water-service piping.
  - 4. Install gate valve onto tapping sleeve. Comply with MSS SP-60. Install valve with stem pointing up and with valve box.
- D. Make connections NPS 2 (DN 50) and smaller with drilling machine according to the following:
  - 1. Install service-saddle assemblies and corporation valves in size, quantity, and arrangement required by utility company standards.
  - 2. Install service-saddle assemblies on water-service pipe to be tapped. Position outlets for corporation valves.
  - 3. Use drilling machine compatible with service-saddle assemblies and corporation valves. Drill hole in main. Remove drilling machine and connect water-service piping.
  - 4. Install corporation valves into service-saddle assemblies.
  - 5. Install manifold for multiple taps in water main.
  - 6. Install curb valve in water-service piping with head pointing up and with service box.
- E. Comply with NFPA 24 for fire-service-main piping materials and installation.
  - 1. Install PE corrosion-protection encasement according to ASTM A 674 or AWWA C105.
- F. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.
  - 1. Install PE corrosion-protection encasement according to ASTM A 674 or AWWA C105.
- G. Install copper tube and fittings according to CDA's "Copper Tube Handbook."
- H. Install PVC, AWWA pipe according to AWWA M23 and ASTM F 645.
- I. Unless otherwise indicated on drawings, bury piping with depth of cover over top at least 36 inches, with top at least 12 inches below level of maximum frost penetration, and according to the following:
  - 1. Under Driveways and Roads: With at least 36 inches cover over top.
  - 2. Under Railroad Tracks: With at least 48 inches cover over top.
  - 3. In Loose Gravelly Soil and Rock: With at least 12 inches additional cover.
  - 4. Under Roads: With at least 36 inches cover over top.
- J. Install piping by tunneling, jacking, or combination of both, under streets and other obstructions that cannot be disturbed.
- K. Extend water-service piping and connect to water-supply source and building water piping systems at outside face of building wall in locations and pipe sizes indicated.
  - 1. Terminate water-service piping at building wall until building water piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building water piping systems when those systems are installed.
- L. Sleeves and mechanical sleeve seals are specified elsewhere.

- M. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.
- N. Anchor service-entry piping to building wall.
- O. See Division 22 sections for potable-water piping inside the building.
- P. See Division 21 sections for fire-suppression water piping inside the building.
- Q. Install water-supply piping with shutoff valve in water supply to eachpost hydrant and drinking fountain. Use curb valve and service box.
- R. Install trap below frost line on drain outlet of each drinking fountain.

3.06 ANCHORAGE INSTALLATION:

- A. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
  - 1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: According to AWWA C600.
  - 2. Gasketed-Joint, PVC Water-Service Piping: According to AWWA M23.
- B. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

3.07 VALVE INSTALLATION:

- A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.
- B. Corporation Valves and Curb Valves: Install each underground curb valve with head pointed up and with service box.

3.08 WATER-METER INSTALLATION:

- A. Install water meters, piping, and specialties according to utility company's written requirements.
- B. Water Meters: Install displacement-type water meters, NPS 2 (DN 50) and smaller, in meter boxes with shutoff valves on water-meter inlets. Include valves on water-meter outlets and valved bypass around meters unless prohibited by authorities having jurisdiction.

3.09 ROUGHING-IN FOR WATER METERS:

- A. Rough-in piping and specialties for water-meter installation according to utility company's written instructions and requirements.

3.10 BACKFLOW-PREVENTER INSTALLATION:

- A. Install backflow preventers of type, size, and capacity indicated. Include valves and test cocks. Install according to requirements of plumbing and health department and authorities having jurisdiction.
- B. Do not install backflow preventers with relief drain in vault or other space subject to flooding.
- C. Do not install bypass piping around backflow preventers.
- D. Support NPS 2-1/2 (DN 65) and larger backflow preventers, valves, and piping near floor and on brick or concrete piers.

3.11 VAULT CONSTRUCTION /INSTALLATION:

- A. See Section 03 30 00 "Concrete Work" for concrete vaults.
- B. Install precast concrete vaults according to ASTM C 891.
- C. Connect drain outlet to storm drainage piping. Refer to Division 33 41 00 for Storm Drainage

3.12 PROTECTIVE ENCLOSURE INSTALLATION:

- A. Install concrete base level and with top approximately 2 inches (50 mm) above grade.
- B. Install protective enclosure over valves and equipment.
- C. Anchor protective enclosure to concrete base.

3.13 FIRE HYDRANT INSTALLATION:

- A. General: Install each fire hydrant with separate gate valve in supply pipe, anchor with restrained joints or thrust blocks, and support in upright position.
- B. AWWA-Type Fire Hydrants: Comply with AWWA M17.

3.14 POST HYDRANT INSTALLATION:

- A. Install post hydrants in pavement or with concrete anchor.

3.15 FIRE DEPARTMENT CONNECTION INSTALLATION

- A. Install ball drip valves at each check valve for fire department connection to mains.
- B. Install protective pipe bollards on two sides of each fire department connection. Pipe bollards are specified in Division 05 Section "Metal Fabrications."

3.16 ALARM DEVICE INSTALLATION

- A. General: Comply with NFPA 24 for devices and methods of valve supervision. Underground valves with valve box do not require supervision.
- B. Supervisory Switches: Supervise valves in open position.
  - 1. Valves: Grind away portion of exposed valve stem. Bolt switch, with plunger in stem depression, to OS&Y gate-valve yoke.
  - 2. Indicator Posts: Drill and thread hole in upper-barrel section at target plate. Install switch, with toggle against target plate, on barrel of indicator post.
- C. Locking and Sealing: Secure unsupervised valves as follows:
  - 1. Valves: Install chain and padlock on open OS&Y gate valve.
  - 2. Post Indicators: Install padlock on wrench on indicator post.
- D. Pressure Switches: Drill and thread hole in exposed barrel of fire hydrant. Install switch.
- E. Connect alarm devices to building fire alarm system. Wiring and fire-alarm devices are specified in Division 28 Section "Fire Detection and Alarm."

### 3.17 CONNECTIONS:

- A. Piping installation requirements are specified in other Division 2 Sections. Drawings indicate general arrangement of piping and specialties.
- B. See Division 2 Section "Utility Materials" for piping connections to valves and equipment.
- C. Connect water-distribution piping to utility water main. Use tapping sleeve and tapping valve.
- D. Connect water-distribution piping to interior domestic-water and fire-suppression piping.
- E. Connect waste piping from drinking fountains to sanitary sewerage system. See Section 33 30 00 "Sanitary Sewerage" for connection to sanitary-sewer piping.
- F. Ground equipment according to Division 26 requirements for Grounding.
- G. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### 3.18 FIELD QUALITY CONTROL:

- A. Piping Tests: Conduct piping tests before joints are covered and after thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: Test at not less than 1-1/2 times working pressure for 2 hours.
  - 1. Increase pressure in 50-psig (350-kPa) increments and inspect each joint between increments. Hold at test pressure for 1 hour; decrease to 0 psig (0 kPa). Slowly increase again to test pressure and hold for 1 more hour. Maximum allowable leakage is 2 quarts (1.89 L) per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.
- C. Prepare reports of testing activities.

### 3.19 IDENTIFICATION:

- A. Install continuous underground detectable warning tape during backfilling of trench for underground water-service piping. Locate below finished grade, directly over piping. See Division 2 Section "Earthwork" for underground warning tapes.
- B. Permanently attach equipment nameplate or marker, indicating plastic water-service piping, on main electrical meter panel. See Division 15 Section 15050 "Mechanical Materials and Methods" for identifying devices.

### 3.20 CLEANING:

- A. Clean and disinfect water-distribution piping as follows:
  - 1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
  - 2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.

3. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or as described below:
  - a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
  - b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.
  - c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
  - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.
- B. Prepare reports of purging and disinfecting activities.
- C. After completing drinking fountain installation, inspect unit. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.
- D. Clean drinking fountains, on completion of installation, according to manufacturer's written instructions.

End of Section

## SECTION 33 30 00 – SANITARY SEWERAGE

### 1 PART I GENERAL

#### 1.01 SUMMARY:

- A. This Section includes sanitary sewerage outside the building.

#### 1.02 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

Division 22 Plumbing  
Section 03 30 00 Concrete Work

#### 1.03 DEFINITIONS:

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. EPDM: Ethylene-propylene-diene-monomer rubber.
- C. PE: Polyethylene plastic.
- D. PVC: Polyvinyl chloride plastic.

#### 1.04 PERFORMANCE REQUIREMENTS:

- A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.
- B. Force-Main Pressure Ratings: At least equal to system operating pressure, but not less than 150 psig.

#### 1.05 SUBMITTALS:

- A. Product Data: For the following:
  - 1. Stainless-steel drainage systems.
  - 2. Backwater valves and cleanouts.
  - 3. Manhole cover inserts.
- B. Shop Drawings: Include plans, elevations, details, and attachments for the following:
  - 1. Precast concrete manholes, including frames and covers.
  - 2. Cast-in-place concrete manholes and other structures, including frames and covers.
- C. Coordination Drawings: Show manholes and other structures, pipe sizes, locations, and elevations. Include details of underground structures and connections. Show other piping in same trench and clearances from sewerage system piping. Indicate interface and spatial relationship between piping and proximate structures.
- D. Coordination Profile Drawings: Show system piping in elevation. Draw profiles at horizontal scale of not less than 1 inch equals 50 feet and vertical scale of not less than 1 inch equals 5 feet. Indicate underground structures and pipe. Show types, sizes, materials, and elevations of other utilities crossing system piping.
- E. Design Mix Reports and Calculations: For each class of cast-in-place concrete.

- F. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Do not store plastic structures, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle precast concrete manholes and other structures according to manufacturer's written rigging instructions.

1.07 PROJECT CONDITIONS:

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.
- B. Locate existing structures and piping to be closed and abandoned.
- C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Architect's written permission.

2 PART II PRODUCTS

2.01 MANUFACTURERS:

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Stainless-Steel Drainage Systems:
    - a. Josam Co.; Blucher-Josam Div.
  - 2. Gray-Iron Backwater Valves and Cleanouts:
    - a. Josam Co.
    - b. McWane, Inc.; Tyler Pipe; Wade Div.
    - c. Smith: Jay R. Smith Mfg. Co.
    - d. Watts Industries, Inc.; Ancon Drain Div.
    - e. Watts Industries, Inc.; Enpoco, Inc. Div.
    - f. Zurn Industries, Inc.; Hydromechanics Div.
  - 3. PVC Backwater Valves and Cleanouts:
    - a. Canplas, Inc.
    - b. IPS Corp.
    - c. NDS, Inc.
    - d. Plastic Oddities, Inc.
    - e. Sioux Chief Manufacturing Co., Inc.
  - 4. Manhole Cover Inserts:



- a. FRW Industries, Inc.
- b. Knutson Manufacturing Co.
- c. Parson Environmental Products, Inc.

## 2.02 PIPING MATERIALS:

- A. Ductile-Iron Sewer Pipe: ASTM A 746, for push-on joints.
  - 1. Compact-Pattern, Ductile-Iron Fittings: AWWA C153, for push-on joints.
  - 2. Gaskets: AWWA C111, rubber.
- B. PVC Sewer Pipe and Fittings: According to the following:
  - 1. PVC Sewer Pipe and Fittings, NPS 15 and Smaller: ASTM D 3034, SDR 35, for solvent-cemented or gasketed joints.
    - a. Gaskets: ASTM F 477, elastomeric seals.

## 2.03 SPECIAL PIPE COUPLINGS AND FITTINGS:

- A. Sleeve-Type Pipe Couplings: ASTM C 1173, rubber or elastomeric sleeve and band assembly fabricated to mate with OD of pipes to be joined, for nonpressure joints.
  - 1. Sleeve Material for Concrete Pipe: ASTM C 443, rubber.
  - 2. Sleeve Material for Cast-Iron Soil Pipe: ASTM C 564, rubber.
  - 3. Sleeve Material for Plastic Pipe: ASTM F 477, elastomeric seal.
  - 4. Sleeve Material for Dissimilar Pipe: Compatible with pipe materials being joined.
  - 5. Bands: Stainless steel, at least one at each pipe insert.
- B. Bushing-Type Pipe Couplings: ASTM C 1173, rubber or elastomeric bushing fabricated to mate with OD of smaller pipe and ID of adjoining larger pipe, for nonpressure joints.
  - 1. Material for Concrete Pipe: ASTM C 443, rubber.
  - 2. Material for Cast-Iron Soil Pipe: ASTM C 564, rubber.
  - 3. Material for Plastic Pipe: ASTM F 477, elastomeric seal.
  - 4. Material for Dissimilar Pipe: Compatible with pipe materials being joined.
- C. Pressure-Type Pipe Couplings: AWWA C219, iron-body sleeve assembly matching OD of pipes to be joined, with AWWA C111 rubber gaskets, bolts, and nuts. Include PE film, pipe encasement.
- D. Ductile-Iron Expansion Joints: Three-piece assembly of telescoping sleeve with gaskets and restrained-type, ductile-iron, bell-and-spigot end sections complying with AWWA C110 or AWWA C153. Include rating for 250 psig minimum working pressure and for expansion indicated. Include PE film, pipe encasement.

## 2.04 PE FILM, PIPE ENCASEMENT:

- A. ASTM A 674 or AWWA C105; PE film, tube, or sheet; 8 mil thickness.

## 2.05 MANHOLES:

- A. Normal-Traffic Precast Concrete Manholes: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.
  - 1. Diameter: 48 inches minimum, unless otherwise indicated.
  - 2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.

3. Base Section: 6 inch minimum thickness for floor slab and 4 inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
  4. Riser Sections: 4 inch minimum thickness, and lengths to provide depth indicated.
  5. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
  6. Gaskets: ASTM C 443 , rubber.
  7. Grade Rings: Include two or three reinforced-concrete rings, of 6 to 9 inch total thickness, that match 24 inch diameter frame and cover.
  8. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at 12 to 16 inch intervals. Omit steps for manholes less than 60 inches deep.
  9. Steps: ASTM C 478 (ASTM C 478M), individual steps or ladder. Omit steps for manholes less than 60 inches (1500 mm) deep.
  10. Pipe Connectors: ASTM C 923 , resilient, of size required, for each pipe connecting to base section.
- B. Cast-in-Place Concrete Manholes: Construct of reinforced-concrete bottom, walls, and top; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, dimensions, and appurtenances indicated.
1. Ballast: Increase thickness of concrete, as required to prevent flotation.
  2. Grade Rings: Include two or three reinforced-concrete rings, of 6 to 9 inch (150 to 229 mm) total thickness, that match 24 inch (610 mm) diameter frame and cover.
  3. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12 to 16 inch intervals. Omit steps for manholes less than 60 inches deep.
  4. Steps: Manufactured from deformed, 1/2 inch (13 mm) steel reinforcement rod complying with ASTM A 615/A 615M and encased in polypropylene complying with ASTM D 4101. Include pattern designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12 to 16 inch (300 to 400 mm) intervals. Omit steps for manholes less than 60 inches (1,500 mm) deep.
- C. Manhole Frames and Covers: ASTM A 536, Grade 60-40-18, ductile-iron castings designed for heavy-duty service. Include 24 inch ID by 7 to 9 inch riser with 4 inch minimum width flange, and 26 inch diameter cover. Include indented top design with lettering "SANITARY SEWER" cast into cover.
- D. Manhole Cover Inserts: Manufactured, plastic form, of size to fit between manhole frame and cover and designed to prevent stormwater inflow. Include handle for removal and gasket for gastight sealing.
1. Type: Solid.
  2. Type: With drainage and vent holes.
  3. Type: With valve.

## 2.06 CONCRETE:

- A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
1. Cement: ASTM C 150, Type II.
  2. Fine Aggregate: ASTM C 33, sand.
  3. Coarse Aggregate: ASTM C 33, crushed gravel.
  4. Water: Potable.

- B. Portland Cement Design Mix: 4,000 psi minimum, with 0.45 maximum water-cementitious materials ratio.
  - 1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  - 2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 , deformed steel.
- C. Structure Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4,000 psi minimum, with 0.45 maximum water-cementitious materials ratio. Include channels and benches in manholes.
  - 1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
    - a. Invert Slope: 2 percent through manhole.
  - 2. Benches: Concrete, sloped to drain into channel.
    - a. Slope: 4 percent.
- D. Ballast and Pipe Supports: Portland cement design mix, 3,000 psi minimum, with 0.58 maximum water-cementitious materials ratio.
  - 1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  - 2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

## 2.07 PROTECTIVE COATINGS:

- A. Description: One- or two-coat, coal-tar epoxy; 15 mil minimum thickness, unless otherwise indicated; factory or field applied to the following surfaces:
  - 1. Concrete Manholes: On interior surface.
  - 2. Manhole Frames and Covers: On surfaces that will be exposed to sewer gases.

## 2.08 CLEANOUTS:

- A. Gray-Iron Cleanouts: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside caulk or spigot connection and countersunk, tapered-thread, brass closure plug. Use units with top-loading classifications according to the following applications:
  - 1. Light Duty: In earth or grass foot-traffic areas.
  - 2. Medium Duty: In paved foot-traffic areas.
  - 3. Heavy Duty: In vehicle-traffic service areas.
  - 4. Extra-Heavy Duty: In roads.
  - 5. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.
- B. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

## 3 PART III EXECUTION

### 3.01 EARTHWORK:

- A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earthwork."

### 3.02 IDENTIFICATION:

- A. Materials and their installation are specified in Division 31 Section "Earthwork." Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.
  - 1. Use warning tape or detectable warning tape over ferrous piping.
  - 2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

### 3.03 PIPING APPLICATIONS:

- A. General: Include watertight joints.
- B. Refer to Part 2 of this Section for detailed specifications for pipe and fitting products listed below. Use pipe, fittings, and joining methods according to applications indicated.
- C. Gravity-Flow Piping: Use the following:
  - 1. NPS 3: Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints, unless otherwise indicated on the drawings.
  - 2. NPS 4 and NPS 6: Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints, unless otherwise indicated on the drawings.
  - 3. NPS 4 and NPS 6: ABS, SDR 35, sewer pipe and fittings; solvent-cemented joints; or gaskets and gasketed joints, only where indicated on the drawings.
  - 4. NPS 8 and NPS 10: Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints, unless otherwise indicated on the drawings.
  - 5. NPS 8 and NPS 10 (DN200 and DN250): PVC sewer pipe and fittings, solvent-cemented joints, or gaskets and gasketed joints, only where indicated on the drawings.
  - 6. NPS 12 to NPS 16 (DN300 to DN400): Ductile-iron sewer pipe, standard-pattern, ductile-iron fittings, gaskets; and gasketed joints, unless otherwise indicated on the drawings.
  - 7. NPS 12 and NPS 15: PVC sewer pipe and fittings, solvent-cemented joints, or gaskets and gasketed joints, only where indicated on the drawings.
  - 8. Pipe Sizes NPS 18 to NPS 24 (DN450 to DN600): Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints.

### 3.04 SPECIAL PIPE COUPLING AND FITTING APPLICATIONS:

- A. Special Pipe Couplings: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
  - 1. Use the following pipe couplings for nonpressure applications:
    - a. Sleeve type to join piping, of same size, or with small difference in OD.
    - b. Increaser/reducer-pattern, sleeve type to join piping of different sizes.
    - c. Bushing type to join piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.
  - 2. Use pressure-type pipe couplings for force-main joints. Include PE film, pipe encasement.
- B. Special Pipe Fittings: Use where indicated. Include PE film, pipe encasement.

### 3.05 INSTALLATION, GENERAL:

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.
- C. Use manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.
- D. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. Install gravity-flow piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.
  - 1. Install piping pitched down in direction of flow, at minimum slope of 2 percent, unless otherwise indicated.
  - 2. Install piping with 36 inch minimum cover, unless otherwise indicated on the drawings.
- F. Extend sanitary sewerage piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.

### 3.06 PIPE JOINT CONSTRUCTION AND INSTALLATION:

- A. General: Join and install pipe and fittings according to installations indicated.
- B. Refer to Division 2 Section "Utility Materials" for basic piping joint construction and installation.
- C. Ductile-Iron Sewer Pipe with Ductile-Iron Fittings: According to AWWA C600.
  - 1. Install PE film, pipe encasement over ductile-iron sewer pipe and ductile-iron fittings according to ASTM A 674 or AWWA C105.
- D. PVC Sewer Pipe and Fittings: As follows:
  - 1. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
  - 2. Join profile sewer pipe fittings with gaskets according to ASTM D 2321 and manufacturer's written instructions.
  - 3. Install according to ASTM D 2321.
- E. System Piping Joints: Make joints using system manufacturer's couplings, unless otherwise indicated.
- F. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.
- G. Install with top surfaces of components, except piping, flush with finished surface.

### 3.07 MANHOLE INSTALLATION:

- A. General: Install manholes, complete with appurtenances and accessories indicated.
- B. Form continuous concrete channels and benches between inlets and outlet.

- C. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere, unless otherwise indicated.
- D. Install precast concrete manhole sections with gaskets according to ASTM C 891.
- E. Construct cast-in-place manholes as indicated.

### 3.08 CONCRETE PLACEMENT:

- A. Place cast-in-place concrete according to ACI 318 and ACI 350R.

### 3.09 CLEANOUT INSTALLATION:

- A. Install cleanouts and riser extension from sewer pipe to cleanout at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
- B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 x 18 x 12 inches deep. Set with tops 1 inch above surrounding grade.
- C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.

### 3.10 TAP CONNECTIONS:

- A. Make connections to existing piping and underground structures so finished Work complies as nearly as practical with requirements specified for new Work.
- B. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6 inch overlap, with not less than 6 inches of concrete with 28 day compressive strength of 3,000 psi .
- C. Make branch connections from side into existing piping, NPS 4 to NPS 20 . Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye with not less than 6 inches of concrete with 28 day compressive strength of 3,000 psi .
- D. Make branch connections from side into existing piping, NPS 21 or larger, or to underground structures by cutting opening into existing unit large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall, unless otherwise indicated. On outside of pipe or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
  - 1. Use concrete that will attain minimum 28 day compressive strength of 3,000 psi, unless otherwise indicated.
  - 2. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
- E. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

### 3.11 CLOSING ABANDONED SANITARY SEWERAGE SYSTEMS:

- A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:
  - 1. Close open ends of piping with at least 8 inch- thick, brick masonry bulkheads.
  - 2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

- B. Abandoned Structures: Excavate around structure as required and use one procedure below:
1. Remove structure and close open ends of remaining piping.
  2. Remove top of structure down to at least 36 inches below final grade. Fill to within 12 inches of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.
  3. Backfill to grade according to Division 2 Section "Earthwork."

3.12 FIELD QUALITY CONTROL:

- A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
1. Place plug in end of incomplete piping at end of day and when work stops.
  2. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.
- B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
1. Submit separate reports for each system inspection.
  2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  4. Reinspect and repeat procedure until results are satisfactory.
- C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.
  2. Test completed piping systems according to authorities having jurisdiction.
  3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
  4. Submit separate reports for each test.
  5. If authorities having jurisdiction do not have published procedures, perform tests as follows:
    - a. Sanitary Sewerage: Perform hydrostatic test.
      - i. Allowable leakage is maximum of 50 gal. per inch of nominal pipe size per mile of pipe, during 24 hour period.
      - ii. Close openings in system and fill with water.
      - iii. Purge air and refill with water.
      - iv. Disconnect water supply.
      - v. Test and inspect joints for leaks.

- vi. Option: Test ductile-iron piping according to AWWA C600, Section "Hydrostatic Testing." Use test pressure of at least 10 psig .
- b. Sanitary Sewerage: Perform air test according to UNI-B-6.
- c. Option: Test concrete piping according to ASTM C 924 .
- d. Force Main: Perform hydrostatic test after thrust blocks, supports, and anchors have hardened. Test at pressure not less than one and one-half times maximum system operating pressure, but not less than 150 psig (1,035 kPa).
  - i. Ductile-Iron Piping: Test according to AWWA C600, Section "Hydraulic Testing."
  - ii. PVC Piping: Test according to AWWA M23, "Testing and Maintenance" Chapter.
- 6. Manholes: Perform hydraulic test according to ASTM C 969 (ASTM C 969M).
- 7. Leaks and loss in test pressure constitute defects that must be repaired.
- 8. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

End of Section



## SECTION 33 41 00 – STORMWATER COLLECTION SYSTEM

### 1 PART I GENERAL

#### 1.01 SCOPE:

- A. Extent of storm sewer collection system work is shown on drawings. Storm Sewer collection system work includes, but is not limited to, the following:
  - 1. Pipe and fittings.
  - 2. Non-pressure transition couplings.
  - 3. Cleanouts.
  - 4. Drains.
  - 5. Manholes.
  - 6. Channel drainage systems.
  - 7. Catch basins.
  - 8. Stormwater inlets.
  - 9. Pipe outlets.

#### 1.02 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to work of this section.

#### 1.03 QUALITY ASSURANCE:

- A. Installer: A firm specializing and experienced in sewer collection system work for not less than two (2) years.
- B. Comply with the requirements of applicable Division 2 sections for excavation and backfilling required in connection with exterior water service piping.

#### 1.04 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
  - 1. Manholes: Include plans, elevations, sections, details, frames, and covers.
  - 2. Catch basins and stormwater inlets. Include plans, elevations, sections, details, frames, covers, and grates.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic manholes, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle manholes according to manufacturer's written rigging instructions.
- D. Handle catch basins and stormwater inlets according to manufacturer's written rigging instructions.

## 1.06 PROJECT CONDITIONS

- A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
  - 1. Notify Architect no fewer than two days in advance of proposed interruption of service.
  - 2. Do not proceed with interruption of service without Architect's written permission.

## 2 PART II PRODUCTS

### 2.01 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 74, Service class.
- B. Gaskets: ASTM C 564, rubber.

### 2.02 STEEL PIPE AND FITTINGS

- A. Corrugated-Steel Pipe and Fittings: ASTM A 760/A 760M, Type I with fittings of similar form and construction as pipe.
  - 1. Standard-Joint Bands: Corrugated steel.
  - 2. Coating: Zinc.

### 2.03 PVC PIPE AND FITTINGS

- A. PVC Type PSM Sewer Piping:
  - 1. Pipe: ASTM D 3034, SDR 35, PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints.
  - 2. Fittings: ASTM D 3034, PVC with bell ends.
  - 3. Gaskets: ASTM F 477, elastomeric seals.

### 2.04 CONCRETE PIPE AND FITTINGS

- A. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76.
  - 1. Tongue-and-groove ends and gasketed joints with ASTM C 443
  - 2. Class III.

### 2.05 NONPRESSURE TRANSITION COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground non-pressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.
- B. Sleeve Materials:
  - 1. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
- C. Unshielded, Flexible Couplings:

1. 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. Dallas Specialty & Mfg. Co.
    - b. Fernco Inc.
    - c. Logan Clay Pipe.
    - d. Mission Rubber Company; a division of MCP Industries, Inc.
  2. Description: Elastomeric sleeve with stainless-steel shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
- D. Shielded, Flexible Couplings:
1. 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. Cascade Waterworks Mfg.
    - b. Dallas Specialty & Mfg. Co.
    - c. Mission Rubber Company; a division of MCP Industries, Inc.
  2. Description: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
- E. Ring-Type, Flexible Couplings:
1. 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. Fernco Inc.
    - b. Logan Clay Pipe.
    - c. Mission Rubber Company; a division of MCP Industries, Inc.
  2. Description: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.

## 2.06 CLEANOUTS

### A. Cast-Iron Cleanouts:

1. 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. Josam Company.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.
  - d. Tyler Pipe.
  - e. Watts Water Technologies, Inc.
  - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.

2. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
3. Top-Loading Classification: Heavy Duty.
4. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

## 2.07 DRAINS

### A. Cast-Iron Area Drains:

1. 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. Josam Company.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.
  - d. Tyler Pipe.
  - e. Watts Water Technologies, Inc.
  - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
2. Description: ASME A112.6.3 gray-iron round body with anchor flange and round grate. Include bottom outlet with inside calk or spigot connection, of sizes indicated.
3. Top-Loading Classification(s): Heavy Duty.

### B. Cast-Iron Trench Drains:

1. 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. Josam Company.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.
  - d. Tyler Pipe.
  - e. Watts Water Technologies, Inc.
  - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
2. Description: ASME A112.6.3, 6-inch wide top surface, rectangular body with anchor flange or other anchoring device, and rectangular grate. Include units of total length indicated and quantity of bottom outlets with inside calk or spigot connections, of sizes indicated.
3. Top-Loading Classification(s): Heavy Duty.

## 2.08 MANHOLES

### A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches minimum unless otherwise indicated.
3. Ballast: Increase thickness of precast concrete sections or add concrete to base section as required to prevent flotation.
4. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.

5. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated, and top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
8. Steps: Individual FRP steps wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than 60 inches.
9. Grade Rings: Reinforced-concrete rings, 6-inch total thickness, to match diameter of manhole frame and cover, and height as required to adjust manhole frame and cover to indicated elevation and slope.

B. Manhole Frames and Covers:

1. Description: Ferrous; 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange and 26-inch diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "STORM SEWER."
2. Material: ASTM A 536, Grade 60-40-18 ductile or ASTM A 48/A 48M, Class 35 gray iron unless otherwise indicated.

2.09 POLYMER-CONCRETE, CHANNEL DRAINAGE SYSTEMS

- A. General Requirements for Polymer-Concrete, Channel Drainage Systems: Modular system of precast, polymer-concrete channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling. Include quantity of units required to form total lengths indicated.

- B. 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:

1. ABT, Inc.
2. ACO USA.
3. Innovative Plastic, Inc.; a subsidiary of T-H Marine Supplies, Inc.
4. Mea-Josam Div.; Josam Company.
5. Poly-Cast.

C. Sloped-Invert, Polymer-Concrete Systems:

1. Channel Sections:
  - a. Interlocking-joint, precast, modular units with end caps.
  - b. 4-inch inside width and deep, rounded bottom, with built-in invert slope of 0.6 percent and with outlets in quantities, sizes, and locations indicated.
  - c. Extension sections necessary for required depth.
  - d. Frame: Include gray-iron or steel frame for grate.
2. Grates:
  - a. Manufacturer's designation "ADA Heavy Duty," with slots or perforations that fit recesses in channels.
  - b. Material: Stainless steel.
3. Covers: Solid gray iron if indicated.
4. Locking Mechanism: Manufacturer's standard device for securing grates to channel sections.

D. Drainage Specialties: Precast, polymer-concrete units.

1. Large Catch Basins:

- a. 24-by-12-inch polymer-concrete body, with outlets in quantities and sizes indicated.
- b. Gray-iron slotted grate.
- c. Frame: Include gray-iron or steel frame for grate.

2. Small Catch Basins:

- a. 19- to 24-inch by approximately 6-inch polymer-concrete body, with outlets in quantities and sizes indicated.
- b. Gray-iron slotted grate.
- c. Frame: Include gray-iron or steel frame for grate.

3. Sediment Interceptors:

- a. 27-inch square, polymer-concrete body, with outlets in quantities and sizes indicated.
- b. 24-inch square, gray-iron frame and slotted grate.

E. Supports, Anchors, and Setting Devices: Manufacturer's standard unless otherwise indicated.

F. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.

## 2.10 CATCH BASINS

A. Standard Precast Concrete Catch Basins:

1. Description: ASTM C 478 precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
3. Riser Sections: 4-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
4. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
5. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
6. Grade Rings: Include two or three reinforced-concrete rings, of 6-inch total thickness, that match 24-inch diameter frame and grate.
7. Steps: Individual FRP steps wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12-inch intervals. Omit steps if total depth from floor of catch basin to finished grade is less than 60 inches.
8. Pipe Connectors: ASTM C 923 resilient, of size required, for each pipe connecting to base section.

## 2.11 STORMWATER INLETS

A. Combination Inlets: Made with vertical curb and horizontal gutter openings, of materials and dimensions according to City standards. Include heavy-duty frames and grates.

B. Frames and Grates: Heavy duty, according to City standards.

## 2.12 PIPE OUTLETS

- A. Head Walls: Cast-in-place reinforced concrete, with apron and tapered sides.
- B. Riprap Basins: Broken, irregularly sized and shaped, graded stone according to NSSGA's "Quarried Stone for Erosion and Sediment Control."
  - 1. Average Size: NSSGA No. R-5, screen opening 5 inches.
- C. Filter Stone: According to NSSGA's "Quarried Stone for Erosion and Sediment Control," No. FS-2, No. 4 screen opening, average-size graded stone.
- D. Energy Dissipaters: According to NSSGA's "Quarried Stone for Erosion and Sediment Control," No. A-1, 3-ton average weight armor stone, unless otherwise indicated.

## 3 PART III EXECUTION

### 3.01 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

### 3.02 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
- C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.
- F. Install gravity-flow, non-pressure drainage piping according to the following:
  - 1. Install piping pitched down in direction of flow.
  - 2. Install piping NPS 6 and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place concrete supports or anchors.
  - 3. Install piping with 24-inch minimum cover.
  - 4. Install hub-and-spigot, cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
  - 5. Install corrugated steel piping according to ASTM A 798/A 798M.
  - 6. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
  - 7. Install reinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."

- G. Install corrosion-protection piping encasement over the following underground metal piping according to ASTM A 674 or AWWA C105:

1. Hub-and-spigot, cast-iron soil pipe and fittings.

### 3.03 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, non-pressure drainage piping according to the following:

1. Join hub-and-spigot, cast-iron soil piping with gasketed joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
2. Join corrugated steel sewer piping according to ASTM A 798/A 798M.
3. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasketed joints.
4. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.
5. Join dissimilar pipe materials with non-pressure-type flexible couplings.

### 3.04 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

1. Use Light-Duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.
2. Use Medium-Duty, top-loading classification cleanouts in asphalt or Portland cement concrete paved foot-traffic areas.
3. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service areas.

- B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding earth grade.

- C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

### 3.05 DRAIN INSTALLATION

- A. Install type of drains in locations indicated.

1. Use Light-Duty, top-loading classification drains in earth or unpaved foot-traffic areas.
2. Use Medium-Duty, top-loading classification drains in paved foot-traffic areas.

- B. Embed drains in 4-inch minimum concrete around bottom and sides.

- C. Fasten grates to drains if indicated.

- D. Set drain frames and covers with tops flush with pavement surface.

- E. Assemble trench sections with flanged joints.

- F. Embed trench sections in 4-inch minimum concrete around bottom and sides.

### 3.06 MANHOLE INSTALLATION

- A. General: Install manholes, complete with appurtenances and accessories indicated.



- B. Install precast concrete manhole sections with sealants according to ASTM C 891.
- C. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.
- D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere unless otherwise indicated.

### 3.07 CATCH BASIN INSTALLATION

- A. Construct catch basins to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated.

### 3.08 STORMWATER INLET AND OUTLET INSTALLATION

- A. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.
- B. Construct riprap of broken stone, as indicated.
- C. Install outlets that spill onto grade, anchored with concrete, where indicated.
- D. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.
- E. Construct energy dissipaters at outlets, as indicated.

### 3.09 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318.

### 3.10 CHANNEL DRAINAGE SYSTEM INSTALLATION

- A. Install with top surfaces of components, except piping, flush with finished surface.
- B. Assemble channel sections to form slope down toward drain outlets. Use sealants, adhesives, fasteners, and other materials recommended by system manufacturer.
- C. Embed channel sections and drainage specialties in 4-inch minimum concrete around bottom and sides.
- D. Fasten grates to channel sections if indicated.
- E. Assemble channel sections with flanged or interlocking joints.
- F. Embed channel sections in 4-inch minimum concrete around bottom and sides.

### 3.11 CONNECTIONS

- A. Connect non-pressure, gravity-flow drainage piping in building's storm building drains specified in Division 22 Section "Facility Storm Drainage Piping."
- B. Connect force-main piping to building's storm drainage force mains specified in Division 22 Section "Facility Storm Drainage Piping." Terminate piping where indicated.
- C. Make connections to existing piping and underground manholes.

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
  2. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
  3. Make branch connections from side into existing piping, NPS 21 or larger, or to underground manholes and structures by cutting into existing unit and creating an opening large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe, manhole, or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
    - a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
    - b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
  4. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.
- D. Connect to sediment interceptors specified in Division 22 Section "Sanitary Waste Interceptors."
- E. Pipe couplings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
1. Use non-pressure-type flexible couplings where required to join gravity-flow, non-pressure sewer piping unless otherwise indicated.
    - a. Shielded flexible couplings for same or minor difference OD pipes.
    - b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.
    - c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

### 3.12 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

- A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:
1. Close open ends of piping with at least 8-inch thick, brick masonry bulkheads.
  2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.
- B. Abandoned Manholes and Structures: Excavate around manholes and structures as required and use one procedure below:
1. Remove manhole or structure and close open ends of remaining piping.
  2. Remove top of manhole or structure down to at least 36 inches below final grade. Fill to within 12 inches of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.

- C. Backfill to grade according to Division 31 Section "Earth Moving."

3.13 IDENTIFICATION

- A. Materials and their installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
  - 1. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.14 CLEANING

- A. Clean interior of piping of dirt and superfluous materials. Flush with potable water.

End of Section

**ARCHITECT:** \_\_\_\_\_

**CONTRACTOR:** \_\_\_\_\_

**OWNER:** \_\_\_\_\_

**LENDER:** \_\_\_\_\_

**BONDING CO.:** \_\_\_\_\_