

BID PROPOSAL  
CONTRACT DOCUMENTS AND SPECIFICATIONS FOR

**CITY OF COTTONDALE  
HURRICANE MICHAEL RECOVERY PROJECTS**

**PREPARED FOR:**

**CITY OF COTTONDALE, FLORIDA**

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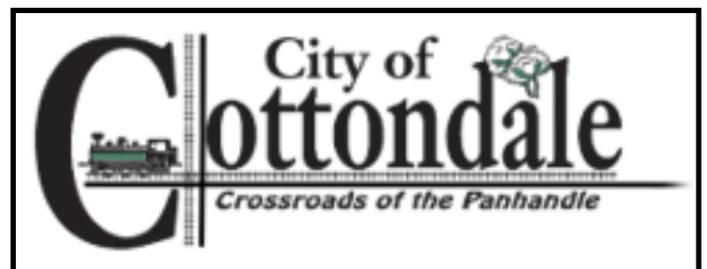
**FUNDED BY:**

Florida Department of Commerce CDBG-DR No. MT144  
Florida Department of Commerce CDBG-DR No. M0159  
Florida Department of Commerce CDBG-DR No. M0042  
Florida Department of Commerce CDBG-DR No. M0144  
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Florida Division of Emergency Management HMGP Grant 4399-090-R  
Florida Division of Emergency Management HMGP Grant 4399-143-R

**PREPARED BY:**



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RELEASED FOR BIDDING: 12.18.2025

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100% PLANS - COTTONDALE HURRICANE MICHAEL RECOVERY PROJECTS

## ADVERTISEMENT FOR BIDS

**CITY OF COTTONDALE** (Owner) is requesting Bids for the construction of the following Project(s):

### HURRICANE MICHAEL RECOVERY PROJECTS

**FUNDED BY: FC CDBG-MIT No. MT144, CDBG-DR No., M0159, M0042, & M0144; FC RIF No. D0213;**

**HMGP Grant 4399-090-R & 4399-143-R**

**DHM: COT22GE, COT22LS, COT22HR, COT22MT, COT22RF**

Bids for the construction of the Project will be received at the **City of Cottondale - 2659 Front Street, Cottondale, FL 32431**, until **January 22, 2026 at 2:00 PM CST**. At that time, or shortly thereafter, the Bids received will be publicly opened and read in the City Hall Meeting Room.

#### **The Project includes the following Work:**

##### **Part A1 - Cottondale Police Station Construction & Fire Station Renovations (MT144):**

Complete construction of a 2,532 SF Police Station and roll up door replacement at adjacent Fire station.

##### **Part A2 - Critical Facilities Generators (4399-143-R/M0159)**

Provide backup power protection to new Police station above and existing Fire Station through the purchase and installation of a 175kW permanent diesel generator with a diesel fuel tank. Provide backup power protection to City Public Works building (25kW permanent diesel generator). Generator installation includes the construction of a concrete pad, enclosure, transfer switch, and electrical connections.

##### **Part A3 - Cottondale Downtown Public Parking Lot Improvements (M0042)**

Resurface and perform various utility upgrades to parking lot behind city hall.

##### **Part B - McKinnon Street Business Parking Area (D0213)**

Construct an 18-space asphalt parking lot and driveway located off McKinnon Street with striping and landscaping.

##### **Part C - US 231 N Crossroads Park (D0213)**

Construct a public park featuring 22 asphalt parking spaces, splash pad, 44'x80' pavilion, and 26'x26' restroom facility. The project also includes installation of an onsite stormwater management system to handle runoff.

##### **Part D - US 231 North and South Entrance Signs (D0213)**

Install entrance signs at both the north and south ends of the city to mark key entry points.

##### **Part E - Lift Station Generators (4399-090-R/M0144)**

Provide backup power protection to 5 lift stations across the City through the purchase and installation of (3) 40kW, (1) 80kW, and (1) 20kW diesel generators with 24-hr subbase fuel tanks.

A detailed listing of the project activities and services is included in the project bid documents.

The Issuing Office for the Bidding Documents is:

**DHM Melvin Engineering**  
**4428 Lafayette Street, Marianna, Florida 32446**  
**Email request: martivickery@melvineng.com**  
**Office phone: (850) 482-3045**

Prospective Bidders may obtain or examine the Bidding Documents at the Issuing Office on Monday through Friday between the hours of **8:00 AM – 4:00 PM** and may obtain copies of the Bidding Documents from the Issuing Office as described below. Partial sets of Bidding Documents will not be available from the Issuing Office. Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including addenda, if any, obtained from sources other than the Issuing Office.

Bidding Documents may be purchased from the Issuing Office during the hours indicated above. Cost does not include shipping charges. Upon the Issuing Office's receipt of payment, printed Bidding Documents or electronic documents will be sent via the prospective Bidder's delivery service. The shipping charge will depend on the shipping method chosen. Bidding Documents are available for purchase in the following formats:

Format:

Bidding Documents (inc. Full-Size Drawings) - \$125.00

Bidding Documents (inc. Half-Size Drawings) - \$100.00

Bidding Documents (E-Copy) – No payment required.

#### **Pre-bid Conference**

A non-mandatory pre-bid conference for the Project will be held on **Tuesday, January 6, 2026, at 10 AM CST** at the Cottondale City Hall located at **2659 Front Street, Cottondale, FL 32431**.

#### **Instructions to Bidders.**

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

#### **This Advertisement is issued by:**

Owner: **City of Cottondale**

By: **Sherri McBride**

Title: **Town Clerk**

**Small business and minority businesses, women's business enterprises, and labor surplus area firms are encouraged to submit proposals, and firms using such subcontractors are strongly encouraged to solicit such firms in the subcontracting process. Any Contracts/subcontracts issued under this procurement must comply with the necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible, in accordance with 2 CFR § 200.321. The work to be performed under this contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 USC 1701u (Section 3).**

**EQUAL OPPORTUNITY EMPLOYER HANDICAP ACCESSIBLE/FAIR HOUSING JURISDICTION**

# INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

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## ARTICLE 1—DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

## ARTICLE 2—BIDDING DOCUMENTS

- 2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- 2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.
- 2.03 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.04 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.
- 2.05 *Electronic Documents*
- A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.
1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

- B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

### **ARTICLE 3—QUALIFICATIONS OF BIDDERS**

- 3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder must submit the following information (as applicable):
  - A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.
  - B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.
  - C. Bidder's state or other contractor license number, if applicable.
  - D. Subcontractor and Supplier qualification information.
  - E. Other required information regarding qualifications.
- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

### **ARTICLE 4—PRE-BID CONFERENCE**

- 4.01 A non-mandatory pre-bid conference will be held at the time and location indicated in the Advertisement or invitation to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference; however, attendance at this conference is not required to submit a Bid.
- 4.02 Information presented at the pre-Bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-Bid conference. Information presented, and statements made at the pre-bid conference will not be binding or legally effective unless incorporated in an Addendum.

### **ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE**

- 5.01 Site and Other Areas
  - A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of

materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

## 5.02 Existing Site Conditions

### A. *Subsurface and Physical Conditions; Hazardous Environmental Conditions*

1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:
  - a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.
  - b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.
  - c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
  - d. Technical Data contained in such reports and drawings.
2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.
4. *Geotechnical Baseline Report/Geotechnical Data Report*: The Bidding Documents contain a Geotechnical Baseline Report (GBR) and Geotechnical Data Report (GDR).
  - a. As set forth in the Supplementary Conditions, the GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations (“Baseline Conditions”). The GBR is a Contract Document.
  - b. The Baseline Conditions in the GBR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GBR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.
  - c. Nothing in the GBR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

- d. As set forth in the Supplementary Conditions, the GDR is a Contract Document containing data prepared by or for the Owner in support of the GBR.
  - B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.
- 5.03 Other Site-related Documents
- A. No other Site-related documents are available.
- 5.04 Site Visit and Testing by Bidders
- A. It is recommended that bidders visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.
  - B. A Site visit is scheduled following the pre-bid conference. Maps to the Site will be available at the pre-Bid conference.
  - C. Bidders visiting the Site are required to arrange their own transportation to the Site.
  - D. All access to the Site other than during a regularly scheduled Site visit must be coordinated through the following Owner or Engineer contact for visiting the Site: **SEE ADVERTISEMENT**. Bidder must conduct the required Site visit during normal working hours.
  - E. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
  - F. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.
  - G. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
  - H. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.
- 5.05 Owner's Safety Program
- A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.06 Other Work at the Site

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

**ARTICLE 6—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS**

6.01 *Express Representations and Certifications in Bid Form, Agreement*

- A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder’s examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.
- B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

**ARTICLE 7—INTERPRETATIONS AND ADDENDA**

- 7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.
- 7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:

**David H. Melvin Consulting Engineers**  
**4428 Lafayette Street, Marianna, Florida, 32446**  
**(850) 482-3045 / [martivickery@melvineng.com](mailto:martivickery@melvineng.com)**

- 7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.
- 7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

**ARTICLE 8—BID SECURITY**

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5% percent of Bidder’s maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required

Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

#### **ARTICLE 9—CONTRACT TIMES**

- 9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.
- 9.02 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

#### **ARTICLE 10—SUBSTITUTE AND “OR EQUAL” ITEMS**

- 10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those “or-equal” or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an “or-equal” or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer within 10 days of the issuance of the Advertisement for Bids or invitation to Bidders. Each such request must comply with the requirements of Paragraphs 7.05 and 7.06 of the General Conditions, and the review of the request will be governed by the principles in those paragraphs. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all registered Bidders. Bidders cannot rely upon approvals made in any other manner.
- 10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder's sole risk.

#### **ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS**

- 11.01 A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so by the Bidding Documents or in the Specifications. If a prospective

Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

- 11.02 The apparent Successful Bidder, and any other Bidder so requested, shall within five days after bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed for those portions of the Work for which such identification is required.
- 11.03 If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.
- 11.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

## **ARTICLE 12—PREPARATION OF BID**

- 12.01 The Bid Form is included with the Bidding Documents.
- A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
- B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."
- 12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.
- 12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.
- 12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

- 12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.
- 12.06 A Bid by an individual must show the Bidder's name and official address.
- 12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.
- 12.08 All names must be printed in ink below the signatures.
- 12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.
- 12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.
- 12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.
- 12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

### **ARTICLE 13—BASIS OF BID**

#### **13.01 Lump Sum**

- A. Bidders must submit a Bid on a lump sum basis as set forth in the Bid Form.

#### **13.02 Unit Price**

- A. Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

#### **13.03 Allowances**

- A. For cash allowances the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

#### **ARTICLE 14—SUBMITTAL OF BID**

- 14.01 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.
- 14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to the location designated in the Advertisement.
- 14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

#### **ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID**

- 15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid,

and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

#### **ARTICLE 16—OPENING OF BIDS**

16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

#### **ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE**

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

#### **ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT**

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

##### *18.05 Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.

18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for

those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

- 18.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

#### **ARTICLE 19—BONDS AND INSURANCE**

- 19.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.
- 19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

#### **ARTICLE 20—SIGNING OF AGREEMENT**

- 20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

**C-300  
BIDDER'S CHECKLIST**

**Project Name:** \_\_\_\_\_ City of Cottdale – Hurricane Michael Recovery Projects \_\_\_\_\_

**Bidder Name:** \_\_\_\_\_

The checklist below is provided to ensure that all documents and certifications required as a part of the bidding process have been completed and included in your bid package. This checklist should be completed and included as a part of the bid package submitted.

- C-300 Bidder's Checklist
- C-410 Bid Proposal (Bid Form)
- C-430 Bid Bond
- C-440 Certifications Regarding Equal Employment Opportunity
- C-451 Qualifications Statement
- C-470 Public Entity Crimes Statement
- C-471 Drug Free Workplace Certification
- C-472 Certification Regarding Lobbying
- C-473 Certifications Regarding Section 3 and Segregated Facilities
- C-474 Certifications Regarding Labor Standards and Prevailing Wage Requirements
- C-475 MBE/WBE Worksheet
- C-480 Certification Regarding Debarment
- C-532 SC-37 Certification Regarding Debarment
- C-533 SC-38 Certification Regarding Debarment (subcontractor)\*
- C-534 SC-51 Contractor Eligibility Form
- C-535 SC-52 Section 3 Participation Report
- C-536 SC-53 Section 3 Participating Report (subcontractor)\*
- C-537 SC-54 Section 3 Documentation for Business Claiming Section 3\*
- C-541 Additional CDBG-DR Regulations

*\*Forms marked with an asterisk may not be applicable to all bidders.*

It is envisioned that this project will be funded with Federal funds from the Hazard Mitigation Grant Program and with Federal funds from the United States Department of Housing and Urban Development (Community Development Block Grant for Disaster Recovery CDBG-DR) and therefore is subject to the Federal laws and regulations associated with that program. As such, the following sections of the specifications should be thoroughly reviewed and by signature below you are acknowledging that these sections have been reviewed and are understood.

- C-111 Advertisement for Bids
- C-200 Instructions to Bidders
- C-520 Contract
- C-530 Federal Contract Provisions
- C-531 CDBG Supplemental Conditions
- C-542 HMGP Contract Provisions
- C-537 Section 3 Contract Clause
- C-539 Wage Decision
- C-800 Supplemental General Conditions of the Construction Contract

In the event the bids submitted by the bidders exceed the amount of funding designated for the project, the Owner may modify the scope of the project and negotiate with the lowest bidder to bring the project within the funding amount allocated.

Signed: \_\_\_\_\_

Print Name and Title: \_\_\_\_\_

# BID FORM FOR CONSTRUCTION CONTRACT

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

## ARTICLE 1—OWNER AND BIDDER

1.01 This Bid is submitted to:

**City of Cottondale  
2659 Front Street, Cottondale, FL 32431**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

## ARTICLE 2—ATTACHMENTS TO THIS BID

2.01 The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security;
- B. List of Proposed Subcontractors;
- C. List of Proposed Suppliers;
- D. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;
- E. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;
- F. Required Bidder Qualification Statement with supporting data;
- G. Completed Bid Form

## ARTICLE 3—BASIS OF BID – UNIT PRICES

3.01 *Unit Price Bids*

- A. Bidder will perform the following Work at the indicated unit prices provided in Attachment G.
- B. Bidder acknowledges that:
  1. Each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and
  2. Estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

**ARTICLE 4—TIME OF COMPLETION**

- 4.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 4.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

**ARTICLE 5—BIDDER’S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA**

- 5.01 *Bid Acceptance Period*
  - A. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.
- 5.02 *Instructions to Bidders*
  - A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.
- 5.03 *Receipt of Addenda*
  - A. Bidder hereby acknowledges receipt of the following Addenda:

<b>Addendum Number</b>	<b>Addendum Date</b>

**ARTICLE 6—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS**

- 6.01 *Bidder’s Representations*
  - A. In submitting this Bid, Bidder represents the following:
    - 1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
    - 2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
    - 3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
    - 4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
    - 5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.

6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 *Bidder's Certifications*

- A. The Bidder certifies the following:
  1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
  2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
  3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
  4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:
    - a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
    - b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.

- c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.
- d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

BIDDER hereby submits this Bid as set forth above:

Bidder:

\_\_\_\_\_  
*(typed or printed name of organization)*

By: \_\_\_\_\_  
*(individual's signature)*

Name: \_\_\_\_\_  
*(typed or printed)*

Title: \_\_\_\_\_  
*(typed or printed)*

Date: \_\_\_\_\_  
*(typed or printed)*

*If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.*

Attest: \_\_\_\_\_  
*(individual's signature)*

Name: \_\_\_\_\_  
*(typed or printed)*

Title: \_\_\_\_\_  
*(typed or printed)*

Date: \_\_\_\_\_  
*(typed or printed)*

Address for giving notices:

\_\_\_\_\_  
\_\_\_\_\_

Bidder's Contact:

Name: \_\_\_\_\_  
*(typed or printed)*

Title: \_\_\_\_\_  
*(typed or printed)*

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

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

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

Bidder's Contractor License No.: (if applicable) \_\_\_\_\_





**Attachment G**  
**City of Cottondale**  
**Hurricane Michael Recovery Projects**

**BID FORM**

DESCRIPTION	GRANT #	CONTRACT TIME	TOTAL PRICE
Part A1 - Cottondale Police Station Construction & Fire Station Renovations	MT144	300 Days	
Part A2 - Critical Facilities Generators	4399-143-R / M0159	180 Days	
Part A3 - Cottondale Downtown Public Parking Lot Improvements	M0042	180 Days	
<b>SUBTOTAL (SUM OF PARTS A1 - A3)</b>			

Part B - McKinnon Street Business Parking Area	D0213	180 Days	
Part C - US 231 N Crossroads Park	D0213	180 Days	
Part D - US 231 North and South Entrance Signs	D0213	90 Days	
Part E - Lift Station Generators	4399-090-R / M0144	180 Days	
<b>SUBTOTAL (SUM OF PARTS B - E)</b>			

<b>TOTAL BID AMOUNT (SUM OF ALL PARTS)</b>			
--------------------------------------------	--	--	--

**Bid Stipulations**

The Owner reserves the right to award only select parts and not all parts, or reject all bids. Contractors may bid on all Parts or only on one or more Parts. The Owner may award all Parts to one contractor or individual Parts to different Contractors based upon what is in the best interest of the Owner including consideration of deductive alternatives. Contractor's bid should be a stand alone bid for each Part.

The Owner will award the contract based on the contractor's experience, qualifications, and the lowest responsible bid, as determined to be in the Owner's best interest. Evaluation of the lowest bid will include consideration of any additive or deductive alternates selected by the Owner. The Owner reserves the right to negotiate, and value engineer the project with the lowest responsible bidder to ensure alignment with the project budget. Additionally, the Owner reserves the right to reject any or all bids.

All employees of the bidder, as well as all employees of any subcontractors working on the project, must provide documentation verifying their legal status and eligibility to work in the United States through the E-Verify system.

The bid price shall include the furnishing a complete and fully operational system constructed in full compliance with all applicable codes and regulations.

**City of Cottondale**  
**Hurricane Michael Recovery Projects**

**Bid Schedule**

**Part A1 - Cottondale Police Station Construction & Fire Station Renovations**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
<b>A</b>	<b>Building Construction</b>				
1	Architectural, Structural, Plumbing, Electrical, Fire Protection, HVAC	LS	1.0		
2	Low Voltage Design Allowance - Allowance for design, furnishing and installation of low voltage systems including voice, cable TV, data, and Wi-Fi cabling, also door access control system and IP security camera system. (100% of allowance amount shall go to low voltage subconsultants direct cost and shall not be used for general contractor's markup or overhead cost)	LS	1.0	\$ 20,000.00	\$ 20,000.00
3	Fire Station Mitigation Allowance - Contractor shall work with the owner to install Hurricane rated roll up doors (x2) to the adjacent Fire Station Building (Allowance amount shall go to contractors direct cost and shall not be used for general contractor's markup or overhead cost)	LS	1.0	\$ 200,000.00	\$ 200,000.00
4	Contingency - To Be Used Only Upon Approval by the Project Owner	LS	1.0	\$ 25,000.00	\$ 25,000.00
<b>Part A1 - Total Amount</b>					

Bidder: \_\_\_\_\_

**City of Cottondale  
Hurricane Michael Recovery Projects**

**Bid Schedule**

**Part A2 - Critical Facilities Generators**

**Materials**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
1	Generator w/ enclosure and ATS (25 KW and 175 KW for Public Works and Police Station)	LS	1.0		
2	Electric Line and Conduit (All locations)	LS	1.0		
3	48 HR Sub-base Fuel Tank (All locations)	EA	2.0		
4	Concrete Pad (All locations)	EA	2.0		
<b>Materials Subtotal</b>					

**Labor**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
1	Generator, ATS, Fuel Tank Installation (All locations)	LS	1.0		
2	Concrete Pad (All locations)	LS	1.0		
<b>Labor Subtotal</b>					

**Part A2 - Total Amount (Materials + Labor)**

**City of Cottondale**  
**Hurricane Michael Recovery Projects**

**Bid Schedule**

**Part A3 - Downtown Public Parking Lot Improvements**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
1	Mobilization	LS	5.0%		
2	Maintenance of Traffic	LS	LS		
3	Erosion Control (Includes all items shown on Sheet C1)	LS	LS		
4	Demolition (includes all items shown on Sheet C1)	LS	LS		
5	Cut and Patch Asphalt (per detail in plans)	SY	45.0		
6	12" Stabilized Subgrade, Type B, LBR 40	SY	260		
7	Installation of Base Material (6" Limerock)	SY	260		
8	Asphalt Concrete (2" Thick Type 9.5-SP; 2 Lifts)	TON	29		
9	Mill and Resurface (per detail in plans)	SY	2,222		
10	Concrete Sidewalk (4" Thick w/Fiber Mesh)	SY	490		
11	6" Dia. Concrete Bollard (see detail on Sheet C6)	EA	2		
12	Install Type F Curb and Gutter	LF	272		
13	Detectable Warning Surface	EA	1		
14	Performance Turf (Zoysia Sod)	SY	7,000		
15	Concrete Ramp w/Alum. Guiderail (per FDOT Std. Index No. 515-070)	LF	21		
16	Concrete Steps (7" Tall x 12" Wide) w/Alum. Guiderail (per FDOT Std. Index No. 515-070)	EA	8		
17	Seating Wall (see detail Sheet C6)	LF	25		
18	Allowance for FPU Electrical Undergrounding Costs	LS	LS	\$ 50,000.00	\$ 50,000.00
19	Painting				
	a. 24" White (Traffic Paint)	LF	12		
	b. 4" White (Traffic Paint)	GM	0.14		
	c. 6" White (Traffic Paint)-Gore Area	GM	0.01		
	d. 12" White (Traffic Paint)--Gore Area	GM	0.01		
	e. White Pavement Message (Traffic Paint)	EA	2		
	f. Handicap Man & Loading Aisle	EA	3		
20	Signs	EA	5		
21	Stormwater Inlets				
	a. 12" Mitered End Section (includes 5'x5'x6" thick concrete rip-rap 6" dia. min.)	EA	2		
22	Stormwater Pipe				

Bidder: \_\_\_\_\_

**City of Cottondale**  
**Hurricane Michael Recovery Projects**

**Bid Schedule**

**Part A3 - Downtown Public Parking Lot Improvements**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
22	Stormwater Pipe				
	a. 12" Pipe	LF	146		
	b. Connect to existing pipe (see Sht. C3)	EA	1		
23	4" Sewer Lateral	LF	185		
24	8" Sewer Lateral	LF	415		
25	4" Sewer Clean-out (per detail in plans)	EA	2		
26	4" Diameter Sewer Manhole	EA	2		
27	Connection to Existing Sewer Manhole	EA	1		
28	6"x8" Tapping Sleeve w/6" Gate Valve	EA	1		
29	2" Water Line	LF	193		
30	6" Water Line	LF	257		
31	3/4" Potable Water RPZ w/Fiberglass Enclosure	EA	2		
32	3/4" Potable Water Meter	EA	2		
33	3/4" Water Line	LF	46		
34	Fire Hydrant Assembly	EA	1		
35	3/4" Freeze Proof Hydrant	EA	1		
36	Digital Message Board Sign	LS	1		
37	Site Lighting	EA	10		
38	Light Pole Rehabilitation	EA	6		
39	County Historic Sign Relocation/Rebuild	EA	1		
40	Flagpole Installation	EA	1		
41	Payment Drop Box Relocation	LS	1		
<b>Part A3 - Total Amount</b>					

Bidder: \_\_\_\_\_

**City of Cottondale  
Hurricane Michael Recovery Projects**

**Bid Schedule**

**Part B - McKinnon Street Parking**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
1	Mobilization	LS	5.0%		
2	Maintenance of Traffic	LS	LS		
3	Erosion Control (Includes all items shown on Sheet C2)	LS	LS		
4	12" Stabilized Subgrade, Type B, LBR 40	SY	950		
5	Installation of Base Material (6" Limerock)	SY	950		
6	Asphalt Concrete (2" Thick Type 9.5-SP; 2 Lifts)	TON	105		
7	Concrete Sidewalk (4" Thick w/Fiber Mesh)	SY	66		
8	Install Type F Curb and Gutter	LF	65		
9	Painting				
	a. 24" White (Traffic Paint)	LF	12		
	b. 4" White (Traffic Paint)	GM	0.06		
	c. White Pavement Message (Traffic Paint)	EA	4		
	d. Handicap Man & Loading Aisle	EA	1		
10	Signs	EA	2		
11	Performance Turf (Zoysia Sod)	SY	500		
12	Sprinter Boxwoods (Gal)	EA	80		
13	Southern Live Oak (2" Caliper 12' Ht Min.)	EA	4		
<b>Part B - Total Amount</b>					

**City of Cottondale**  
**Hurricane Michael Recovery Projects**

**Bid Schedule**

**Part C - US 231 North "Crossroads Park"**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
1	Mobilization	LS	5.0%		
2	Maintenance of Traffic	LS	LS		
3	Erosion Control (Includes all items shown on Sheet C4.1)	LS	LS		
4	Demolition (includes all items shown on Sheet C6)	LS	LS		
5	12" Stabilized Subgrade	SY	2,290		
6	Installation of Base Material (6" Limerock)	SY	2,290		
7	Installation of Base Material (4" Limerock)--Walking Trail	SY	540		
8	Asphalt Concrete (1.5" Thick Type 9-5SP, 2 Lifts)	TON	59		
9	Asphalt Concrete (2" Thick Type 9.5-SP; 2 Lifts)	TON	252		
10	Concrete Sidewalk (4" Thick w/Fiber Mesh)	SY	275		
11	Detectable Warning Surface	EA	2		
12	Install Type F Curb and Gutter	LF	600		
13	Drop Curb	LF	86		
14	Performance Turf (Zoysia Sod)	SY	14,500		
15	Signs	EA	1		
16	Painting				
	a. 24" White (Thermoplastic)	LF	24		
	b. 4" White (Traffic Paint)	GM	0.1		
	c. White Pavement Message (Traffic Paint)	EA	8		
	d. Handicap Man & Loading Aisle	EA	1		
	e. 6" Double Yellow Solid (Thermoplastic)	LF	25		
	f. 12" Wide White Pedestrian Striping (Thermoplastic)	LF	125		
17	Stormwater Inlets				
	a. Type D DBI (see detail sheet C2.1)	EA	1		
	b. 24" Nyloplast Drain Basin w/2'x3' Curb Inlet with slot	EA	2		
	c. 24" Nyloplast Drain Basin w/standard grate & 15" Outlet	EA	2		
	d. 15" MES (includes 5'x5'x6" thick concrete rip-rap 6" dia. min.)	EA	2		
	e. 18" MES (includes 5'x5'x6" thick concrete rip-rap 6" dia. min.)	EA	1		
18	Stormwater Piping				
	a. 15" Pipe (concrete pipe or approved equal)	LF	489		
	b. 18" Pipe (concrete pipe or approved equal)	LF	22		

Bidder: \_\_\_\_\_

**City of Cottondale  
Hurricane Michael Recovery Projects**

**Bid Schedule**

**Part C - US 231 North "Crossroads Park"**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
	b. 18" Pipe (concrete pipe or approved equal)	LF	22		
19	4' Tall Vinyl Coated Chainlink Fence w/(2) 6' Swing Gates	LF	1,100		
20	6" Sewer :Lateral	LF	216		
21	6" Sewer Clean-out	EA	2		
22	Connect to Existing Sewer Main	EA	1		
23	2"x8" Tapping Sleeve w/2" Gate Valve	EA	1		
24	2" Potable Water Meter	EA	1		
25	2" RPZ w/insulated enclosure	EA	1		
26	2" Water Service	LF	233		
27	1" Irrigation Meter	EA	1		
28	1" RPZ w/insulated enclosure	EA	1		
29	Pavilion Construction (Include Purchase Allowance of \$200,000 for Materials) - Install Foundation, Lighting, Wiring, and Electrical Outlets. •8 Space 125-amp sub-panel: Power should be wired from existing pole as shown on plans to provide power with direct bury cable) •Electrical Outlets (x8) w/Outdoor Electrical Box Cover	LS	1		
30	Restroom Construction (Including Purchase Allowance of \$144,000 for Materials)	LS	1		
31	Splashpad	LS	1		
32	Playground Allowance	LS	1	\$ 50,000.00	\$ 50,000.00
33	Bench (includes 3'x5'x4" thick concrete pad)	EA	2		
34	Dog Park Fence (4' Tall Vinyl Coated Chainlink Fence w/(2) 4' Swing Gates	LF	432		
35	Dog Park Amenities Allowance	LS	1	\$ 10,000.00	\$ 10,000.00
36	Trash Receptacles - Kaiwrxin (60L Heavy Duty Metal)	EA	4		
37	Landscaping Allowance	LS	1	\$ 15,000.00	\$ 15,000.00
38	Contingency	LS	1	\$ 20,000.00	\$ 20,000.00
<b>Part C - Total Amount</b>					

Bidder: \_\_\_\_\_

**City of Cottondale**  
**Hurricane Michael Recovery Projects**

**Bid Schedule**

**Part D - US 231 North & South Entrance Signs**

<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Total Price</b>
1	Mobilization	LS	1.0		
2	North Entrance Sign	LS	1.0		
3	South Entrance Sign	LF	1.0		
<b>Part D - Total Amount</b>					

Bidder: \_\_\_\_\_

**City of Cottondale  
Hurricane Michael Recovery Projects**

**Bid Schedule**

**Part E - Lift Station Generators**

**Materials**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
1	Generator w/ enclosure (20 KW)	EA	1.0		
2	Generator w/ enclosure (40 KW)	EA	3.0		
3	Generator w/ enclosure (80KW)	EA	1.0		
4	Automated Transfer Switches; Wiring; Conduits; Concrete Pads	EA	5.0		
5	24HR Sub-base Fuel Tank	EA	5.0		

**Materials Subtotal**

**Labor**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
1	Installation (Generators, ATS, Fuel Tanks, Setup)	LS	1.0		

**Labor Subtotal**

**Part E - Total Amount (Materials + Labor)**

**BID BOND (PENAL SUM FORM)**

<p><b>Bidder</b></p> <p>Name: _____</p> <p>Address (<i>principal place of business</i>):</p> <p>_____</p> <p>_____</p>	<p><b>Surety</b></p> <p>Name: _____</p> <p>Address (<i>principal place of business</i>):</p> <p>_____</p> <p>_____</p>
<p><b>Owner</b></p> <p>Name: _____</p> <p>Address (<i>principal place of business</i>):</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p><b>Bid</b></p> <p>Project (<i>name and location</i>):</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Bid Due Date:</p>
<p><b>Bond</b></p> <p>Penal Sum:</p> <p>Date of Bond:</p>	
<p>Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.</p>	
<p>Bidder</p> <p>_____</p> <p>(<i>Full formal name of Bidder</i>)</p>	<p>Surety</p> <p>_____</p> <p>(<i>Full formal name of Surety</i>) (<i>corporate seal</i>)</p>
<p>By: _____</p> <p>(<i>Signature</i>)</p>	<p>By: _____</p> <p>(<i>Signature</i>) (<i>Attach Power of Attorney</i>)</p>
<p>Name: _____</p> <p>(<i>Printed or typed</i>)</p>	<p>Name: _____</p> <p>(<i>Printed or typed</i>)</p>
<p>Title: _____</p>	<p>Title: _____</p>
<p>Attest: _____</p> <p>(<i>Signature</i>)</p>	<p>Attest: _____</p> <p>(<i>Signature</i>)</p>
<p>Name: _____</p> <p>(<i>Printed or typed</i>)</p>	<p>Name: _____</p> <p>(<i>Printed or typed</i>)</p>
<p>Title: _____</p>	<p>Title: _____</p>
<p><i>Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.</i></p>	

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1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
  - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
  - 3.2. All Bids are rejected by Owner, or
  - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

**SECTION C-440**

**CERTIFICATION BY BIDDER**

This certification is required pursuant to Executive Order 11246 (30 F.R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.

NAME AND ADDRESS OF BIDDER (include ZIP Code):

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. Yes ( ) No ( )
2. Compliance reports were required to be filed in connection with such contract or subcontract. Yes ( ) No ( )
3. Bidder has filed all compliance reports due under applicable instructions, including SF 100. Yes ( ) No ( )
4. Have you ever been or are you being considered for sanction due to violation of Executive Order 112246, as amended? Yes ( ) No ( )

NAME AND TITLE OF SIGNER (Please Type):

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

**ARTICLE 1—GENERAL INFORMATION**

1.01 Provide contact information for the Business:

Legal Name of Business:			
Corporate Office			
Name:		Phone number:	
Title:		Email address:	
Business address of corporate office:			
Local Office			
Name:		Phone number:	
Title:		Email address:	
Business address of local office:			

1.02 Provide information on the Business’s organizational structure:

Form of Business:	<input type="checkbox"/> Sole Proprietorship <input type="checkbox"/> Partnership <input type="checkbox"/> Corporation		
<input type="checkbox"/> Limited Liability Company <input type="checkbox"/> Joint Venture comprised of the following companies:			
1.			
2.			
3.			
Provide a separate Qualification Statement for each Joint Venturer.			
Date Business was formed:		State in which Business was formed:	
Is this Business authorized to operate in the Project location?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Pending	

1.03 Provide information regarding the Business’s officers, partners, and limits of authority.

Name:		Title:	
Authorized to sign contracts:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Limit of Authority:	\$
Name:		Title:	
Authorized to sign contracts:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Limit of Authority:	\$
Name:		Title:	
Authorized to sign contracts:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Limit of Authority:	\$
Name:		Title:	

**ARTICLE 2—LICENSING**

2.01 Provide information regarding licensure for Business:

Name of License:			
Licensing Agency:			
License No:		Expiration Date:	
Name of License:			
Licensing Agency:			
License No:		Expiration Date:	

**ARTICLE 3—DIVERSE BUSINESS CERTIFICATIONS**

3.01 Provide information regarding Business’s Diverse Business Certification, if any. Provide evidence of current certification.

Certification	Certifying Agency	Certification Date
<input type="checkbox"/> Disadvantaged Business Enterprise		
<input type="checkbox"/> Minority Business Enterprise		
<input type="checkbox"/> Woman-Owned Business Enterprise		
<input type="checkbox"/> Small Business Enterprise		
<input type="checkbox"/> Disabled Business Enterprise		
<input type="checkbox"/> Veteran-Owned Business Enterprise		
<input type="checkbox"/> Service-Disabled Veteran-Owned Business		
<input type="checkbox"/> HUBZone Business (Historically Underutilized) Business		
<input type="checkbox"/> Other		
<input type="checkbox"/> None		

**ARTICLE 4—SAFETY**

4.01 Provide Worker’s Compensation Insurance Documentation.

Year	
Company	

**ARTICLE 5—FINANCIAL**

5.01 Provide information regarding the Business’s financial stability. Provide the most recent audited financial statement, and if such audited financial statement is not current, also provide the most current financial statement.

Financial Institution:			
Business address:			
Date of Business’s most recent financial statement:		<input type="checkbox"/> Attached	
Date of Business’s most recent audited financial statement:		<input type="checkbox"/> Attached	
Financial indicators from the most recent financial statement			
Contractor’s Current Ratio (Current Assets ÷ Current Liabilities)			
Contractor’s Quick Ratio ((Cash and Cash Equivalents + Accounts Receivable + Short Term Investments) ÷ Current Liabilities)			

**ARTICLE 6—SURETY INFORMATION**

6.01 Provide information regarding the surety company that will issue required bonds on behalf of the Business, including but not limited to performance and payment bonds.

Surety Name:			
Surety is a corporation organized and existing under the laws of the state of:			
Is surety authorized to provide surety bonds in the Project location?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Is surety listed in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” published in Department Circular 570 (as amended) by the Bureau of the Fiscal Service, U.S. Department of the Treasury? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

**ARTICLE 7—INSURANCE**

7.01 Provide information regarding Business’s insurance company(s), including but not limited to its Commercial General Liability carrier. Provide information for each provider.

Name of insurance provider, and type of policy (CLE, auto, etc.):			
Insurance Provider		Type of Policy (Coverage Provided)	
Are providers licensed or authorized to issue policies in the Project location?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Does provider have an A.M. Best Rating of A-VII or better?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

**ARTICLE 8—CONSTRUCTION EXPERIENCE**

8.01 Provide information that will identify the overall size and capacity of the Business.

Average number of current full-time employees:	
Estimate of revenue for the current year:	
Estimate of revenue for the previous year:	

8.02 Provide information regarding the Business’s previous contracting experience.

Years of experience with projects like the proposed project:			
As a general contractor:		As a joint venturer:	
Has Business, or a predecessor in interest, or an affiliate identified in Paragraph 1.03:			
Been disqualified as a bidder by any local, state, or federal agency within the last 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Been barred from contracting by any local, state, or federal agency within the last 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Been released from a bid in the past 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Defaulted on a project or failed to complete any contract awarded to it? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Refused to construct or refused to provide materials defined in the contract documents or in a change order? <input type="checkbox"/> Yes <input type="checkbox"/> No			

Been a party to any currently pending litigation or arbitration? <input type="checkbox"/> Yes <input type="checkbox"/> No
Provide full details in a separate attachment if the response to any of these questions is Yes.

- 8.03 List all projects currently under contract in Schedule A and provide indicated information.
- 8.04 List a minimum of three and a maximum of six projects completed in the last 5 years in Schedule B and provide indicated information to demonstrate the Business’s experience with projects similar in type and cost of construction.
- 8.05 In Schedule C, provide information on key individuals whom Business intends to assign to the Project. Provide resumes for those individuals included in Schedule C. Key individuals include the Project Manager, Project Superintendent, Quality Manager, and Safety Manager. Resumes may be provided for Business’s key leaders as well.

**ARTICLE 9—REQUIRED ATTACHMENTS**

- 9.01 Provide the following information with the Statement of Qualifications:
  - A. If Business is a Joint Venture, separate Qualifications Statements for each Joint Venturer, as required in Paragraph 1.02.
  - B. Diverse Business Certifications if required by Paragraph 3.01.
  - C. Certification of Business’s safety performance if required by Paragraph 4.02.
  - D. Financial statements as required by Paragraph 5.01.
  - E. Attachments providing additional information as required by Paragraph 8.02.
  - F. Schedule A (Current Projects) as required by Paragraph 8.03.
  - G. Schedule B (Previous Experience with Similar Projects) as required by Paragraph 8.04.
  - H. Schedule C (Key Individuals) and resumes for the key individuals listed, as required by Paragraph 8.05.
  - I. Additional items as pertinent.

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This Statement of Qualifications is offered by:

Business: \_\_\_\_\_  
*(typed or printed name of organization)*

By: \_\_\_\_\_  
*(individual's signature)*

Name: \_\_\_\_\_  
*(typed or printed)*

Title: \_\_\_\_\_  
*(typed or printed)*

Date: \_\_\_\_\_  
*(date signed)*

*(If Business is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest: \_\_\_\_\_  
*(individual's signature)*

Name: \_\_\_\_\_  
*(typed or printed)*

Title: \_\_\_\_\_  
*(typed or printed)*

Address for giving notices:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Designated Representative:

Name: \_\_\_\_\_  
*(typed or printed)*

Title: \_\_\_\_\_  
*(typed or printed)*

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

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

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

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**Schedule A—Current Projects**

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

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**Schedule B—Previous Experience with Similar Projects**

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

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**Schedule B—Previous Experience with Similar Projects**

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

**Schedule C—Key Individuals**

<b>Project Manager</b>			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
<b>Project Superintendent</b>			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

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<b>Safety Manager</b>			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
<b>Quality Control Manager</b>			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

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**SWORN STATEMENT UNDER FLORIDA STATUTE SECTION 287.133 (3) (A) ON PUBLIC ENTITY CRIMES**

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Proposal, or Contract for \_\_\_\_\_.
2. This sworn statement is submitted by (entity), \_\_\_\_\_,  
Whose business address is, \_\_\_\_\_, and  
(if applicable) Federal Employer Identification Number (FEIN) is \_\_\_\_\_  
(if the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement).
3. My name is \_\_\_\_\_ and my relationship to the  
entity named above is \_\_\_\_\_ (title).
4. I understand that a "public entity crime" as defined in paragraph 287.133(1) (g) Florida Statute, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States including, but not limited to , any bid or contract for goods or services to be provided to any public entity or any agency or public subdivision of any other state or of the United States and involved antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy or material misrepresentation.
5. I understand that "convicted" or "convicted" as defined in paragraph 287.133 (1) (b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime with or without an adjudication of guilt, in any federal or state trial court of records relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilty or nolo contendere.
6. I understand that an "affiliate" as defined in Paragraph 287.133(1) (a), Florida Statutes, means:
  - a. A predecessor or successor of a person convicted of a public entity crime; or
  - b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one of shares constituting a controlling income among persons when not for fair interest in another person, or a pooling of equipment or income among persons when not for fair market value under a length agreement, shall be a prima facie case that one person controls another person. A person who knowingly convicted of a public entity crime, in Florida during the preceding 36 months shall be considered an affiliate.
7. I understand that a "person" as defined in paragraph 287.133 (1) (e), Florida Statutes, means any natural person or entity organized under the laws of the state or of the United States with the legal power to enter into a binding contract provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

8. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies)

- Neither the entity submitting this sworn statement, nor any officers, directors, executive, partners, shareholders, employees, member, or agents who are active in management of the entity, nor affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.
- The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. (Please attach a copy of the final order)
- The person or affiliate was placed on the convicted BIDDER list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in public interest to remove the person or affiliate from the convicted BIDDER list. (Please attach a copy of the final order)
- The person or affiliate has not been placed on the convicted BIDDER list. (Please describe any action taken by, or pending with, the department of General Services)

I understand that the submission of this form to the contracting officer for the Public Entity identified in paragraph 4 above is for that Public Entity only, and that this form is valid through December 31 of the calendar year in which it is filed. I also understand that I am required to inform the Public Entity prior to entering a contract in excess of the threshold amount provided in Section 287.017, Florida Statutes, for category two of any change in the information contained in this form.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

STATE OF FLORIDA  
COUNTY OF: \_\_\_\_\_

PERSONALLY APPEARED BEFORE ME, the undersigned authority, who, after first being sworn by me, affixed his/her signature at the space provided above on this day of \_\_\_\_\_, 20\_\_\_\_, and is personally known to me, or has provided \_\_\_\_\_ as identification.

\_\_\_\_\_  
Notary Public  
My Commission expires: \_\_\_\_\_

**DRUG FREE WORKPLACE CERTIFICATION**  
**(This form must be completed and attached to proposal)**

Preference shall be given to businesses with drug-free workplace programs. Pursuant to Section 287.087, Florida Statutes, whenever two or more bids which are equal with respect price, quality, and service are received by the state or by any political subdivision for the procurement of commodities or contractual services, a response received from a business that certified that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie responses will be followed in none of the tied providers has a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the workplace specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, available drug counseling, rehabilitation providing employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities of contractual services that are under bid a copy of the statement specified in paragraph #1.
4. In the statement specified in paragraph #1, notify the employees that, as a condition of working on the commodities or contractual services that are under proposal, the employee will abide by the terms of the statement and will notify the employer of any conviction of or pleas of guilty or no contest to, and violation of Chapter 893, Florida Statutes, or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on any employee who is convicted or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

**As the person authorized to sign this statement, I certify that this firm complies fully with the above requirements.**

\_\_\_\_\_  
**Company Name**

\_\_\_\_\_  
**Authorized Signature**

\_\_\_\_\_  
**Federal I.D. Number or SSN**

\_\_\_\_\_  
**Printed Name**

**C-472**

**Section C-472  
44 C.F.R. APPENDIX A, PART 18  
CERTIFICATION REGARDING LOBBYING**

Certification for Contracts, Grants, Loans, and Cooperative Agreements (To be submitted with each bid or offer exceeding \$100,000).

The undersigned certifies, to the best of his or her knowledge, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 et seq., apply to this certification and disclosure, if any.

---

Signature of Contractor's Authorized Official

---

Name and Title of Contractor's Authorized Official

---

Date

**CERTIFICATION OF BIDDER REGARDING SECTION 3 AND SEGREGATED FACILITIES**

\_\_\_\_\_  
Name of Prime Contractor

\_\_\_\_\_  
Project Name and Number

The undersigned hereby certifies that:

I agree to comply with all applicable requirements of the Section 3 of the Housing and Urban Development Act of 1968 (24 CFR Part 75). Best efforts must be made to extend Section 3 opportunities to verified Section 3 residents and business concerns to meet these minimum numeric goals:

1. Twenty-five percent (25%) of the total hours on a Section 3 project must be worked by Section 3 workers; and
2. Five percent (5%) of the total hours on a Section 3 project must be worked by Targeted Section 3 workers.

Preference for Contracting with Section 3 Business Concerns

The Town of Malone is required by HUD Regulation 24 CFR Part 75 to make best efforts to contract with businesses that direct economic opportunities to Section 3 workers. As part of its qualitative efforts, the Town of Malone has elected to institute a preference which stipulates that if two or more bids are equal in price then the award preference will be given to the bidder with the highest number of qualified Section 3 subcontractors and/or workers.

Programmatic Responsibilities

Contractors and/or Subcontractors are expected to meet the minimum goals listed above, to the greatest extent feasible. All efforts to utilize Section 3 businesses and workers should be documented, and this Section 3 Project Plan should be submitted for all relevant project bids.

No segregated facilities will be maintained.

\_\_\_\_\_  
Name and Title of Signer:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## CONTRACTOR

### Section 3 Plan Format

\_\_\_\_\_ agrees to implement the following specific affirmative action steps directed at increasing the utilization of lower income residents and businesses with the City/County of \_\_\_\_\_.

- A. To ascertain from the locality's CDBG program official the exact boundaries of the Section 3 covered project area and where advantageous, seek the assistance of local officials in preparing and implementing the affirmative action plan.
- B. To attempt to recruit from within the County/City the necessary number of lower income residents through: Local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within or serving the project area such as Service Employment and Redevelopment (SER), Opportunities Industrialization Center (OIC), Urban League, Concentrated Employment Program, Hometown Plan or the U.S. Employment Service.
- C. To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists.
- D. To insert this Section 3 plan in all bid documents, and to require all bidders on subcontracts to submit a Section 3 affirmative action plan including utilization goals and the specific steps planned to accomplish these goals.
- E. To ensure this Section 3 plan in all bid documents, and to require all bidders on subcontracts to submit a Section 3 affirmative action plan including utilization goals and the specific steps planned to accomplish these goals.
- F. To formally contact unions, subcontractors, and trade associations to secure their cooperation for this program.
- G. To ensure that all appropriate project area business concerns are notified of pending sub contractual opportunities.
- H. To maintain records, including copies of correspondence, memoranda, etc., which document that all the above affirmative action steps have been taken.
- I. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this Section 3 plan.
- J. To list on Form A, information related to subcontracts to be awarded.
- K. To list on Form B, all projected workforce needs for all phases of this project by occupation, trade, skill level, and number of positions.

As officers and representatives of \_\_\_\_\_.  
(Name of Contractor)

We, the undersigned, have read and fully agree to this Affirmative Action Plan, and become a party to the full implementation of this program.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

**FORM A- PROPOSED SUBCONTRACTORS BREAKDOWN**

FOR THE PERIOD COVERING \_\_\_\_\_, 20\_\_ THROUGH \_\_\_\_\_, 20\_\_  
(DURATION OF THE CDBG-ASSISTED PROJECT)

Check the box that applies and complete the table if applicable:

- This project WILL NOT utilize subcontractors.
- This project MAY utilize the following subcontractors:

No.	Sect3 Bus.	Subcontractor Name	Subcontractor Address and Phone Number	Trade	Subcontract Amount
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

\* The Project Area is coextensive with the City/County of \_\_\_\_\_'s boundaries.

\_\_\_\_\_  
Company

\_\_\_\_\_  
Project Name

\_\_\_\_\_  
Project Number

\_\_\_\_\_  
EEO Officer (Signature)

\_\_\_\_\_  
Date

**FORM B – LIST OF PERMANENT EMPLOYEES**

This form is required for all Section 3-triggered projects and must be submitted with bid or application for funding and again with the final Section 3 compliance report.

Project Name	Contract Execution Date	Construction Start Date	Today's Date

Please list all current permanent employees (both full and part-time) employed by your company (or local/regional office) as of the signature date on Certification Form, as well as employees of all subcontractors working on this project (if applicable). Use additional sheets as necessary. A computer-generated employee registry can be provided in lieu of this form if it includes the worker's name, employer and job category and indicates Section 3/targeted Section 3 status.

No.	Name of Worker	Employer	Job Category/Trade	Section 3 Worker (Y/N)	Targeted Section 3 Worker (Y/N)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Please note that your business may be eligible for Section 3 Business certification if at least 75% of your labor hours performed on all contracts over the past three-month period were performed by employees who meet one of the following categories below:

- The worker lives within one mile of the Section 3 project (or, if fewer than 5,000 people live within one mile of the Section 3 project, within a circle centered on the Section 3 project that is sufficient to encompass a population of 5,000 people according to the most recent U.S. Census);
- The worker is a HUD YouthBuild participant; or
- The worker's income for the previous or annualized calendar year is below 80% of the current area

median income for the area in which the worker resides. (Use the worker's annual gross income based on AMI for a single-person household.) HUD income limits can be found at <https://www.huduser.gov/portal/datasets/il.html>.)

**C-474**  
**Certification Regarding Labor Standards and Prevailing Wage**

TO (*Appropriate Recipient*):

DATE:

c/o

PROJECT NUMBER (*If any*):

PROJECT NAME:

1. The undersigned, having executed a contract with \_\_\_\_\_  
for the construction of the above-identified project, acknowledges that:

- a) The Labor Standards provisions are included in the aforesaid contract;
- b) Correction of any infractions of the aforesaid conditions, including infractions by any of his subcontractors and any lower tier subcontractors, is his responsibility;

2. He certifies that:

- a) Neither he nor any firm, partnership or association in which he has substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6(b) of the Regulations of the Secretary of Labor, Part 5 (*29 CFR, Part 5*) or pursuant to Section 3(a) of the Davis-Bacon Act, as amended (*40 U.S.C. 276a-2(a)*).
- b) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designated as an ineligible contractor pursuant to any of the aforementioned regulatory or statutory provisions.

3. He agrees to obtain and forward to the aforementioned recipient within ten days after the execution of any subcontract, including those executed by his subcontractors and any lower tier subcontractors, a Subcontractor's Certification Concerning Labor Standards and Prevailing Wage Requirements executed by the subcontractor.

4. He certifies that:

- a) The legal name and the business address of the undersigned are:

b) The undersigned is:

- (1) A single proprietorship
- (2) A partnership
- (3) A corporation organized in the State of \_\_\_\_\_
- (4) Other organization (*Describe*) \_\_\_\_\_

c) The name, title and address of the owner, partners or officers of the undersigned are:

Name	Title	Address
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Certification Regarding Labor Standards and Prevailing Wage

---

d) The names and addresses of all other persons , both natural and corporate, having a substantial interest in the undersigned, and the nature of the interest are (*if none, so state* ):

Name	Title	Address
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

---

e) The names, addresses and trade classifications of all other building construction contractors in which the undersigned has a substantial interest are (*if none, so state*):

Name	Title	Address
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

---

(Contractor)

Date \_\_\_\_\_

By \_\_\_\_\_

**WARNING**

U.S. Criminal Code, Section 1010, Title 18, U.S.C., provides in part: "Whoever, .... Makes, passes, 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.

MBE/WBE & SECTION 3 Contact Worksheet

Efforts must show in the use of Minority and Women Owned Business Enterprises (WBE/MBE) and concerns of Section 3 applicable enterprises. A minimum of 3 quotes per trade needs to be acquired. Please complete the required MBE Contact Process form to accompany this document.

Any contractor bidding on a project must show effort in outreach to these classified groups. All contractors must list below MBE/WBE enterprises they have contacted concerning this project. Please note that as part of the bid award process, the jurisdiction and the funding agency will contact enterprises listed by the contractor for verification of this effort. The funding agency will also review this information before approving an award to a contractor. Failure of effort in this requirement could prevent consideration of award to the contractor.

Name of Company	Address	Phone	Contact Name	Date of Contact

I certify the information provided is true and correct, and failure to complete this form or any misrepresentation of information could result in rejection of the bid submission from the company.

Certifying Officer Signature \_\_\_\_\_

Date \_\_\_\_\_

City MBE/WBE Contacts List

The following are a list of possible contacts for MBE/WBE usage as it relates to the requirements 24 CFR Part 85.36

1. <https://vendor.myfloridamarketplace.com/search/vendor>  
My Florida Marketplace Vendor Search
2. <https://oevforbusiness.mwsbe.com/>  
City of Tallahassee MBE/DBE Directory
3. <https://oevforbusiness.mwsbe.com/>  
Leon County MWSBE Directory
4. <https://osd.dms.myflorida.com/directories>  
State of Florida DBE/WBE Directory
5. <http://adeca.alabama.gov/Divisions/ced/cdp/Pages/ombe.aspx>  
ADECA Certified WMBE Directory (State of Alabama)
6. <https://pensacola.mwdbe.com/>  
City of Pensacola Certified MBE/WBE Firm Directory

**Section C-476  
WHISTLEBLOWER PROTECTION**

Pursuant to Section 828 of Pub. L 112-239, "National Defense Authorization Act for Fiscal Year 2013" and permanently extended through the enactment of Pub. L 114—261 (December 14, 2016), this award, related subawards, and related contracts over the simplified acquisition threshold and all employees working on this award, related subawards, and related contracts over the simplified acquisition threshold are subject to the whistleblower rights and remedies established at 41 U.S.C. § 4712. Subrecipients, their subrecipients, and their contractors awarded contracts over the simplified acquisition threshold related to this award, shall inform their employees, in writing, in the predominant language of the workforce, of the employee whistleblower rights and protections under 41 U.S.C. § 4712. This clause shall be inserted in all subawards and in contracts over the simplified acquisition threshold related to this award; best efforts should be made to include this clause in any subawards and contracts awarded prior to the effective date of this provision.

The Contractor certifies or affirms that it has read this statement and will comply with 41 U.S.C. § 4712.

\_\_\_\_\_  
Signature of Contractor's Authorized Official

\_\_\_\_\_  
Name and Title of Contractor's Authorized Official

\_\_\_\_\_  
Date

**CERTIFICATION REGARDING DEBARMENT, SUSPENSION,  
AND OTHER RESPONSIBILITY MATTERS PRIMARY COVERED TRANSACTIONS**

- (1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principal:
- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
  - (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
  - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
  - (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- (2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

\_\_\_\_\_  
Project Name

\_\_\_\_\_  
Bidder's Sam.gov #

*Registration with Sam.gov is a requirement  
for bidders to be awarded the contract.*

\_\_\_\_\_  
Project Number

\_\_\_\_\_  
Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Firm

\_\_\_\_\_  
Street Address

\_\_\_\_\_  
City, State, Zip

**CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

**Lower Tier Covered Transactions**

- (1) The prospective lower tier participant certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective lower tier participant is unable to certify to the above statement, the prospective participant shall attach an explanation to this form.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Local Government

\_\_\_\_\_  
Title

\_\_\_\_\_  
CDBG Contract Number

\_\_\_\_\_  
Firm

\_\_\_\_\_  
Street Address

\_\_\_\_\_  
City, State, Zip

\_\_\_\_\_  
Date

NOTICE OF AWARD

Date of Issuance:

Owner: **City of Cottondale**

Owner's Project No.:

Engineer: **David H. Melvin Inc.**

Engineer's Project No.: **COT22HR**

Contract Name: **Hurricane Michael Recovery Projects**

Bidder:

Bidder's Address:

You are hereby notified that your Bid dated \_\_\_\_\_, for the above Contract was approved at the \_\_\_\_\_, regular meeting of the Cottondale City Council subject to final approval by the Florida Department of Commerce. Therefore, we hereby issue this Notice of Award on this day:

\_\_\_\_\_.

The Contract Price of the awarded Contract is \$\_\_\_\_\_. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

\_\_\_ unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award or has been transmitted or made available to Bidder electronically.

Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner \_\_\_ counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited. Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: City of Cottondale

By (signature): \_\_\_\_\_

Name (printed): \_\_\_\_\_

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

## AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between \_\_\_\_\_ (“Owner”) and \_\_\_\_\_ (“Contractor”).

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

### ARTICLE 1—WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

**To be inserted upon award.**

1.02 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Hurricane Michael Recovery Projects**

### ARTICLE 2 - ENGINEER

2.01 The Owner has retained **David H. Melvin, Inc.** (“Engineer”) to act as Owner’s representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

2.02 The part of the Project that pertains to the Work has been designed by Engineer.

### ARTICLE 3 - CONTRACT TIMES

3.01 *Time is of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

3.02 *Contract Times: Days*

A. The Work will be substantially complete within **240** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **270** days after the date when the Contract Times commence to run.

3.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Substantial Completion:* Contractor shall pay Owner **\$425** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
  2. *Completion of Remaining Work:* After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **\$200** for each day that expires after such time until the Work is completed and ready for final payment.
  4. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.
- B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

#### ARTICLE 4 - CONTRACT PRICE

- 4.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:
- A. Contract Price is for all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit. **Contract Price: \$\_\_\_\_\_.**
- 4.02 *Submittal and Processing of Payments*
- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.
- 4.03 *Progress Payments; Retainage*
- A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the **5th** day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
    1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.
      - a. **95** percent of the value of the Work completed (with the balance being retainage).
        - 1) If 50 percent or more of the Work has been completed, as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

- b. **95** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
  - B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to **100** percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **200** percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.
- 4.04 *Final Payment*
- A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.
- 4.05 *Consent of Surety*
- A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.
- 4.06 *Interest*
- A. All amounts not paid when due will bear interest at the rate of **0** percent per annum.

**ARTICLE 5 - CONTRACT DOCUMENTS**

- 5.01 *Contents*
- A. The Contract Documents consist of all of the following:
    - 1. This Agreement.
    - 2. Bonds:
      - a. Performance bond (together with power of attorney).
      - b. Payment bond (together with power of attorney).
    - 3. General Conditions.
    - 4. Supplementary Conditions.
    - 5. Specifications as listed in the table of contents of the project manual (copy of list attached).
    - 6. Drawings (attached), with each sheet bearing the following general title:
    - 7. Contractor's Bid
    - 8. Addenda (numbers \_\_\_ to \_\_\_, inclusive).
    - 9. Exhibits to this Agreement (enumerated as follows):
    - 10. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
      - a. Notice to Proceed.
      - b. Work Change Directives.
      - c. Change Orders.
      - d. Field Orders.
      - e. Warranty Bond, if any.
  - B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).
  - C. There are no Contract Documents other than those listed above in this Article 7.

- D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

## ARTICLE 6 - REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

### 6.01 *Contractor's Representations*

- A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:
1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
  2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
  4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
  5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
  6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.
  7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
  8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
  9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

6.02 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:
  1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
  2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
  3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
  4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

7.03 *Standard General Conditions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on \_\_\_\_\_ (which is the Effective Date of the Contract).

Owner:

Contractor:

**City of Cottondale, Florida**

\_\_\_\_\_  
(typed or printed name of organization)

\_\_\_\_\_  
(typed or printed name of organization)

By:

\_\_\_\_\_  
(individual's signature)

By:

\_\_\_\_\_  
(individual's signature)

Date:

\_\_\_\_\_  
(date signed)

Date:

\_\_\_\_\_  
(date signed)

Name:

\_\_\_\_\_  
(typed or printed)

Name:

\_\_\_\_\_  
(typed or printed)

Title:

\_\_\_\_\_  
(typed or printed)

Title:

\_\_\_\_\_  
(typed or printed)

*(If [Type of Entity] is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest:

\_\_\_\_\_  
(individual's signature)

Attest:

\_\_\_\_\_  
(individual's signature)

Title:

**City Clerk**  
\_\_\_\_\_  
(typed or printed)

Title:

\_\_\_\_\_  
(typed or printed)

Address for giving notices:

**2659 Front Street**

**Cottondale, FL 32431**

Address for giving notices:

Designated Representative:

Name:

**Sherri McBride**  
\_\_\_\_\_  
(typed or printed)

Designated Representative:

Name:

\_\_\_\_\_  
(typed or printed)

Title:

**City Clerk**  
\_\_\_\_\_  
(typed or printed)

Title:

\_\_\_\_\_  
(typed or printed)

Address:

**2659 Front Street**

**Cottondale, FL 32431**

Address:

Phone:

\_\_\_\_\_

Phone:

\_\_\_\_\_

Email:

**cityclerk@cityofcottondale.net**

*(If [Type of Entity] is a corporation, attach evidence of authority to sign. If [Type of Entity] is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)*

Email:

\_\_\_\_\_

License No.:

\_\_\_\_\_  
(where applicable)

State:

\_\_\_\_\_

**CERTIFICATE OF OWNER'S ATTORNEY**

I, the undersigned, \_\_\_\_\_, the duly authorized and acting  
legal representative of \_\_\_\_\_ do hereby

certify as follows:

I have examined the attached contract(s) and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly authorized; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

The supplemental conditions contained in this section are intended to cooperate with, to supplement, and to modify the general conditions and other specifications. In case of disagreement with any other section of this contract, the Supplemental Conditions shall govern.

1. Termination (Cause and Convenience)
2. Access to Records
3. Retention of Records
4. Remedies
5. Environmental Compliance (Clean Air Act and Clean Water Act)
6. Energy Efficiency
7. Special Equal Opportunity Provisions
8. Conflict of Interest
9. Utilization of Minority and Women’s Businesses
10. Federal Labor Standards Provisions (Davis-Bacon, Copeland, and Contract Work Hours Act)
11. Guidance to Contractor for Compliance with Labor Standards Provisions
12. E-Verify

=====

**1. Termination (Cause and Convenience)**

- A. This contract may be terminated in whole or in part in writing by either party in the event of substantial failure by the other party to fulfill its obligations under this contract through no fault of the terminating party, provided that no termination may be effected unless the other party is given:
  - (1) not less than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate; and
  - (2) an opportunity for consultation with the terminating party prior to termination.
- B. This contract may be terminated in whole or in part in writing by the local government for its convenience, provided that the other party is afforded the same notice and consultation opportunity specified in l(a) above.
- C. If termination for default is effected by the local government, an equitable adjustment in the price for this contract shall be made, but
  - (1) no amount shall be allowed for anticipated profit on unperformed services or other work, and
  - (2) any payment due to the contractor at the time of termination may be adjusted to cover any additional costs to the local government because of the contractor’s default.

If termination for convenience is effected by the local government, the equitable adjustment shall include a reasonable profit for services or other work performed for which profit has not already been included in an invoice.

For any termination, the equitable adjustment shall provide for payment to the contractor for services rendered and expenses incurred prior to receipt of the notice of intent to terminate, in addition to termination settlement costs reasonably incurred by the contractor relating to commitments (e.g., suppliers, subcontractors) which had become firm prior to receipt of the notice of intent to terminate.

- D. Upon receipt of a termination action under paragraphs (a) or (b) above, the contractor shall (1) promptly discontinue all affected work (unless the notice directs otherwise) and (2) deliver or otherwise make available to the local government all data, drawings, reports specifications, summaries and other such information, as may have been accumulated by the contractor in performing this contract, whether completed or in process.



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- E. Upon termination, the local government may take over the work and may award another party a contract to complete the work described in this contract.
- F. If, after termination for failure of the contractor to fulfill contractual obligations, it is determined that the contractor had not failed to fulfill contractual obligations, the termination shall be deemed to have been for the convenience of the local government. In such event, adjustment of the contract price shall be made as provided in paragraph (c) above.

### 2. Access to Records

The local government, the Florida Department of Economic Opportunity, the U.S. Department of Housing and Urban Development, the Comptroller General of the United States, the Chief Financial Officer of the State of Florida, the Auditor General of the State of Florida, the Florida Office of Program Policy Analysis and Government Accountability, and any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the contractor which are directly pertinent to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

### 3. Retention of Records

The contractor shall retain all records relating to this contract for six years after the local government makes final payment and all other pending matters are closed.

### 4. Remedies

Unless otherwise provided in this contract, all claims, counter-claims, disputes and other matters in question between the local government and the contractor, arising out of or relating to this contract, or the breach of it, will be decided by arbitration, if the parties mutually agree, or in a Florida court of competent jurisdiction.

### 5. Environmental Compliance

If this contract exceeds \$100,000, the contractor shall comply with all applicable standards, orders, or requirements issued under section 306 of the Clean Air Act (42 USC 1857(h), section 508 of the Clean Water Act (33 USC 1368), Executive Order 11738, and U.S. Environmental Protection Agency regulations (40 CFR Part 15). The contractor shall include this clause in any subcontracts over \$100,000.

### 6. Energy Efficiency

The contractor shall comply with any mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163).

### 7. Special Equal Opportunity Provisions

#### A. **Activities and Contracts Not Subject to Executive Order 11246, as Amended**

(Applicable to Federally assisted construction contracts and related subcontracts \$10,000 and under.)

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

- (1) The contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor shall take affirmative action to ensure that applicants for employment are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, 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.

**CDBG Supplemental Conditions for Construction Contracts**

- (2) The contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by Contracting Officer seeking forth the provisions of this nondiscrimination clause. The contractor shall state that all qualified applicants be considered without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- (3) Contractors shall incorporate foregoing requirements in all subcontracts.

**B. Executive Order 11246, as Amended (through 2014), Section 202 Equal Opportunity Clause (Applicable to contracts/subcontracts above \$10,000)**

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

- (1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, 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, sexual orientation, gender identity, 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 by the contracting officer setting forth the provisions of this nondiscrimination clause.
- (2) The contractor will, in all solicitations or advancements 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, sexual orientation, gender identity, or national origin.
- (3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information."
- (4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (5) The contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (6) The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept. 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

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- (8) The contractor will include the provisions of paragraphs (1) through (7) 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 No. 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 may be directed by the Secretary of Labor 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, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

**(C) Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246). (Applicable to contracts/subcontracts exceeding \$10,000.)**

- (a) The Offerer's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
- (b) The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Female participation: 6.9% (statewide)

Minority participation (See Appendix at CDBG-25 for goals for each county)

These goals are applicable to all Contractor's construction work (whether or not it is federally-assisted) performed in the covered area. If the Contractor performs construction work in a geographic area located outside of the covered area, it shall apply the goals established for such geographic area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3 (a), and its efforts to meet the goals established or the geographic area where the contract resulting from his solicitation is to be performed. The hours of minority and female employment or training must be substantially uniform throughout the length of the contract and in each trade the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

- (c) The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.
- (d) As used in this Notice, and in the contract resulting from the solicitation, the "covered area" is the county in which the contract work is being undertaken.

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**(D) 41 CFR 60-4.3. Equal Opportunity Clauses**

- (a) The equal opportunity clause published at 41 CFR 60-1.4(a) of this chapter is required to be included in, and is part of, all nonexempt Federal contracts and subcontracts, including construction contracts and subcontracts. The equal opportunity clause published at 41 CFR 60-1.4(b) is required to be included in, and is a part of, all nonexempt federally assisted construction contracts and subcontracts. In addition to the clauses described above, all Federal contracting officers, all applicants and all nonconstruction contractors, as applicable, shall include the specifications set forth in this section in all Federal and federally assisted construction contracts in excess of \$10,000 to be performed in geographical areas designated by the Director pursuant to § 60-4.6 of this part and in construction subcontracts in excess of \$10,000 necessary in whole or in part to the performance of nonconstruction Federal contracts and subcontracts covered under the Executive order.

Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246).

1. As used in these specifications:
  - A. “Covered area” means the geographical area described in the solicitation from which this contract resulted;
  - B. “Director” means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
  - C. “Employer identification number” means the Federal Social Security number used on the Employer’s quarterly Federal Tax Return, U. S. Treasury Department Form 941.
  - D. “Minority” includes:
    - (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
    - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
    - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Island); and
    - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
3. If the contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U. S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor’s or subcontractor’s failure to take good faith efforts to achieve the Plan goals and timetables.

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4. The contractor shall implement the specific affirmative action standards provided in paragraphs 7.A. through P. of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in geographical areas where they do not have a federal or federally-assisted construction contract shall apply the minority and female goals established for the geographic area where the contract is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.
5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U. S. Department of Labor.
7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
  - (a) Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to each construction project. The contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
  - (b) Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
  - (c) Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the contractor by the union or, if referred, not employed by the contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the contractor may have taken.
  - (d) Provide immediate written notification to the Director when the union or unions with which the contractor has a collective bargaining agreement has not referred to the contractor a minority person or woman sent by the contractor, or when the contractor has other information that the union referral process has impeded the contractor's efforts to meet its obligations.

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- (e) Develop on-the-job training opportunities and/or participate in training programs for the areas which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the contractor's employment needs, especially those programs funded or approved by the Department of Labor. The contractor shall provide notice of these programs to the sources compiled under 7.(b) above.
- (f) Disseminate the contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- (g) Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with on-site supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- (h) Disseminate the contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the contractor's EEO policy with other contractors and subcontractors with whom the contractor does or anticipates doing business.
- (i) Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female recruitment students and to minority and female recruitment and training organizations serving the contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
- (j) Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a contractor's work force.
- (k) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR 60-3.
- (l) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- (m) Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the contractor's obligations under these specifications are being carried out.
- (n) Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- (o) Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- (p) Conduct a review, at least annually, of all supervisors' adherence to and performance under the contractor's EEO policies and affirmative action obligations.

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8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations 7.(a) through (p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7.(a) through (p) of these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the contractor. The obligation to comply, however, is the contractor's and failure of such a group to fulfill an obligation shall not be a defense for the contractor's noncompliance.
9. A single goal for minorities and separate single goal for women have been established. The contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the contractor has achieved its goals for women generally, the contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
10. The contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
11. The contractor shall not enter into any subcontract with any person or firm debarred from government contracts pursuant to Executive Order 11246.
12. The contractor shall carry out sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensively as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its effort to ensure equal employment opportunity. If the contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
14. The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee, the name, address, telephone numbers, construction trade, union affiliation, if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance and upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

**E. Certification of Non-Segregated Facilities (Contracts over \$10,000)**

The contractor does not maintain or provide for its employees any segregated facilities at any of its establishments, and does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The contractor certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract.

As used in this certification, “segregated facilities” mean any waiting rooms, work areas, rest rooms and wash rooms, restaurants, and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise.

The contractor further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause; that it will retain such certifications in its files; and that it will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods) .

**F. Civil Rights Act of 1964**

Under Title VI of the Civil Rights Act of 1964, no person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

**G. Section 109 of the Housing and Community Development Act of 1974**

No person in the United States shall on the grounds of race, color, national origin, religion or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title.

**H. “Section 3” Compliance in the Provision of Training, Employment and Business Opportunities**

- (1) The work to be performed under this contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 USC 1701u (Section 3). The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- (2) The parties to this contract agree to comply with HUD's regulations in 24 CFR Part 135, which implement Section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the Part 135 regulations.

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- (3) The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this Section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the Section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
- (4) The contractor agrees to include this Section 3 clause in every subcontract subject to compliance with regulations in 24 CFR Part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this Section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR Part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR Part 135.
- (5) The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR Part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR Part 135.
- (6) Noncompliance with HUD's regulations in 24 CFR Part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- (7) With respect to work performed in connection with Section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 USC 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with Section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

**I. Section 503 Handicapped (Contracts \$2,500 or more)**

- (1) The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices such as the following: employment, upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.
- (2) The Contractor agrees to comply with the rules, regulations and relevant orders of the Secretary of Labor issued pursuant to the Act.
- (3) In the event of the Contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- (4) The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, provided by or through the contracting officer. Such notices shall state the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified handicapped employees and applicants for employment, and the rights of applicants and employees.

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- (5) The contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or their contract understanding, that the contractor is bound by the terms of Section 503 of the Rehabilitation Act of 1973, and is committed to take affirmative action to employ and advance in employment physically and mentally handicapped individuals.
- (6) The contractor will include the provisions of this clause in every subcontract or purchase order of \$2,500 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to Section 503 of the Act, 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 Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance.

**J. Age Discrimination in Employment Act of 1967, as Amended**

It shall be unlawful for an employer-

- (1) to fail or refuse to hire or to discharge any individual or otherwise discriminate against any individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's age;
- (2) to limit, segregate, or classify his employees in any way which would deprive or tend to deprive any individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's age; or
- (3) to reduce the wage rate of any employee in order to comply with this chapter.

**K. Title II of the Genetic Information Nondiscrimination Act of 2008 (GINA)**

- (1) Under Title II of the Genetic Information Nondiscrimination Act, it is illegal to discriminate against employees or applicants because of genetic information. Employers are prohibited from using genetic information in making employment decisions. GINA restricts employers and other entities covered by Title II (employment agencies, labor organizations and joint labor-management training and apprenticeship programs - referred to as "covered entities") from requesting, requiring or purchasing genetic information, and strictly limits the disclosure of genetic information.

The law forbids discrimination on the basis of genetic information when it comes to any aspect of employment, including hiring, firing, pay, job assignments, promotions, layoffs, training, fringe benefits, or any other term or condition of employment.

- (2) "Genetic information" includes information about an individual's genetic tests and the genetic tests of an individual's family members, as well as information about the manifestation of a disease or disorder in an individual's family members (i.e. family medical history). Family medical history is included in the definition of genetic information because it is often used to determine whether someone has an increased risk of getting a disease, disorder, or condition in the future.

**8. Conflict of Interest of Officers or Employees of the Local Jurisdiction, Members of the Local Governing Body, or Other Public Officials**

No officer or employee of the local jurisdiction or its designees or agents, no member of the governing body, and no other public official of the locality who exercises any function or responsibility with respect to this contract, during his/her tenure or for one year thereafter, shall have any interest, direct or indirect, in any contract or subcontract, or the proceeds thereof, for work to be performed. Further, the contractor shall cause to be incorporated in all subcontracts the language set forth in this paragraph prohibiting conflict of interest.

**9. Utilization of Minority and Women Firms (M/WBE)**

The contractor shall take all necessary affirmative steps to assure that M/WBE firms are utilized when possible as suppliers and/or subcontractors, as applicable. Prior to contract award, the contractor shall document efforts to utilize M/WBE firms, including identifying what firms were solicited as suppliers and/or subcontractors, as applicable. Information regarding certified M/WBE firms can be obtained from:

- Florida Department of Management Services, Office of Supplier Diversity,
- Florida Department of Transportation (construction services, particularly highway),
- Minority Business Development Center in most major cities, and
- Local government M/WBE programs in many large counties and cities.

A firm recognized as an M/WBE by any of the above agencies is acceptable for the CDBG program.

**10. Federal Labor Standards Provisions**

**(Davis-Bacon Act, Copeland Act, and Contract Works Hours & Safety Standards Act)** The Project to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

- A. (1) (a) 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 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 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.

- (b) (i) 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

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- (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.
- (ii) 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.)
- (iii) In the event that 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 designed 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 the additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)
- (iv) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (b)(ii) or (iii) 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.
- (c) 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.
- (d) 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 owners, 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.

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- (3) (a) Payrolls and Basic Records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work 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).
- (b) (i) 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 owners, 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, DC 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).
- (ii) 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.
- (iii) The weekly submission of a properly executed certification set forth on the reverse side of Option Form WH-347 shall satisfy the requirement for submission of the “Statement of Compliance” required by paragraph A(3)(b)(ii) of this section.

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- (iv) 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.
- (c) The contractor or subcontractor shall make the records required under paragraph A(3)(a) 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 to make such records available may be grounds for debarment action pursuant to 29 CFR Part 5.12.
- (4) (a) Apprentices and Trainees.
- (i) 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 the 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.

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- (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 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 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 contract 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 by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contract 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 referenced 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 U. S. Department of Labor (USDOL) 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 USDOL, or the employees or their representatives.
- (10) (a) **Certification of Eligibility.** By entering into this contract, the contractor certifies that 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.

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- (b) 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.
- (c) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 USC 1001. Additionally, U.S. Criminal Code, Section 1010, Title 18, USC, “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.”
- (11) Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this contract are applicable shall be discharged or in any other manner discriminated against by the contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this contract to his employer.
- B. Contract Work Hours and Safety Standards Act. As used in the 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 contract, 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. Health and Safety
- (1) 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.

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- (2) 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 State 96).
- (3) 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 or the Secretary of Labor shall direct as a means of enforcing such provisions.

**11. Guidance to Contractor for Compliance with Labor Standards Provisions**
**A. Contracts with Two Wage Decisions**

If the contract includes two wage decisions, the contractor, and each subcontractor who works on the site, must submit either two separate payrolls (one for each wage decision) or one payroll which identifies each worker twice and the hours worked under each wage decision. One single payroll, reflecting each worker once, may be submitted provided the Contractor uses the higher rate in the wage decisions for each identical job classification. However, where a job classification is not listed in a wage decision and is needed for that portion of the work, the classification **must** be added to the wage decision. A worker may not be paid at the rate for a classification using the hourly rate for that same classification in another wage decision. After the additional classification is approved, the contractor may pay the higher of the two rates and submit one payroll, if desired.

**B. Complying with Minimum Hourly Amounts**

- (1) The minimum hourly amount due to a worker in each classification is the total of the amounts in the “Rates” and “Fringe Benefits” (if any) columns of the applicable wage decision.
- (2) The contractor may satisfy this minimum hourly amount by any combination of cash and bona fide fringe benefits, regardless of the individual amounts reflected in the “Rates” and “Fringe Benefits” columns.
- (3) A contractor payment for a worker which is required by law is not a fringe benefit in meeting the minimum hourly amount due under the applicable wage decision. For example, contractor payments for FICA or unemployment insurance are not a fringe benefit; however, contractor payments for health insurance or retirement are a fringe benefit. Generally, a fringe benefit is bona fide if (a) it is available to most workers and (b) involves payments to a third party.
- (4) The hourly value of the fringe benefit is calculated by dividing the contractor’s annual cost (excluding any amount contributed by the worker) for the fringe benefit by 2080. Therefore, for workers with overtime, an additional payment may be required to meet the minimum hourly wages since generally fringe benefits have no value for any time worked over 40 hours weekly. (If a worker is paid more than the minimum rates required by the wage decision, this should not be a problem. As long as the total wages received by a worker for straight time equals the hours worked times the minimum hourly rate in the wage decision, the requirement of the Davis-Bacon and Related Acts has been satisfied.)

**C. Overtime**

For any project work over 40 hours weekly, a worker generally must be paid 150% of the actual hourly cash rate received, not the minimum required by the wage decision. (The Davis-Bacon and related acts only establish minimum rates and does not address overtime; the Contract Work Hours Act contains the overtime requirement and uses “basic rate of pay” as the base for calculation, not the minimum rates established by the Davis-Bacon and related acts.)

**CDBG Supplemental Conditions for Construction Contracts****D. Deductions**

Workers who have deductions, not required by law, from their pay must authorize these deductions in writing. The authorization must identify the purpose of each deduction and the amount, which may be a specific dollar amount or a percentage. A copy of the authorization must be submitted with the first payroll containing the deduction. If deducted amounts increase, another authorization must be submitted. If deducted amounts decrease, no revision to the original authorization is needed. Court-ordered deductions, such as child support, may be identified by the responsible payroll person in a separate document. This document should identify the worker, the amount deducted and the purpose. A copy of the court order should be submitted.

**E. Classifications Not Included in the Wage Decision**

If a classification not in the wage decision is required, please advise the owner's representative in writing and identify the job classification(s) required. In some instances, the State agency may allow the use of a similar classification in the wage decision.

Otherwise, the contractor and affected workers must agree on a minimum rate, which cannot be lower than the lowest rate for any trade in the wage decision. Laborers (including any subcategory of the laborer classification) and truck drivers are not considered a trade for this purpose. If the classification involves a power equipment operator, the minimum cannot be lower than the lowest rate for any power equipment operator in the wage decision. The owner will provide forms to document agreement on the minimum rate by the affected workers and contractor.

The USDOL must approve the proposed classification and rate. The contractor may pay the proposed rate until the USDOL makes a determination. Should the USDOL require a higher rate, the contractor must make wage restitution to the affected worker(s) for all hours worked under the proposed rate.

**F. Supervisory Personnel**

Foremen and other supervisory personnel who spend at least 80% of their time supervising workers are not covered by the Davis-Bacon and Related Acts. Therefore, a wage decision will not include such supervisory classifications and their wages are not subject to any minimums under the Davis-Bacon and Related Act or overtime payments under the Contract Work Hours and Safety Standards Act. However, foremen and other supervisory personnel who spend less than 80% of their time engaged in supervisory activities are considered workers/mechanics for the time spent engaged in manual labor and must be paid at least the minimum in the wage decision for the appropriate classification(s) based on the work performed.

**G. Sole Proprietorships/Independent Contractors/Leased Workers**

The nature of the relationship between a prime contractor and a worker does not affect the requirement to comply with the labor standards provisions of this contract. The applicability of the labor standards provisions is based on the nature of the work performed.

If the work performed is primarily manual in nature, the worker is subject to the labor standards provisions in this contract. For example, if John Smith is the owner of ABC Plumbing and performs all plumbing work himself, then Mr. Smith is subject to the labor standards provisions, including minimum wages and overtime. His status as "owner" is irrelevant for labor standards purposes.

If a worker meets the IRS standards for being an independent contractor, and is employed as such, this means that the worker must submit a separate payroll as a subcontractor rather than be included on some other payroll. The worker is still subject to the labor standards provisions in this contract, including minimum wages and overtime.

**CDBG Supplemental Conditions for Construction Contracts**

If a contractor or subcontractor leases its workers, they are subject to the labor standards provisions in this contract, including minimum wages and overtime. The leasing firm must submit payrolls and these payrolls must reflect information required to determine compliance with the labor standards provisions of this contract, including a classification for each worker based on the nature of the work performed, number of regular hours worked, and number of overtime hours worked.

#### H. Apprentices/Helpers

A worker may be classified as an apprentice **only if participating in a federal or state program.**

Documentation of participation must be submitted. Generally, the apprentice program specifies that the apprentice will be compensated at a percentage of the journeyman rate. For Davis-Bacon Act purposes, the hourly rate cannot be lower than the percentage of the hourly rate for the classification in the applicable wage decision.

If the worker does not participate in a federal or state apprentice program, then the worker must be classified according to duties performed. This procedure may require classification in the “trade” depending on tools used, or as a laborer if specialized tools of the trade are not used. The contractor may want to consult with the Wage and Hour Division of the U.S. Department of Labor located in most large cities regarding the appropriate classification.

Presently, no worker may be classified as a “helper”. As with apprentices not participating in a formal apprentice program, the worker must be classified according to duties performed and tools used.

## 12. E-Verify

Contractors and subcontractors performing work funded by CDBG subgrants are required to enroll in the U.S. Department of Homeland Security’s E-Verify system to verify the employment eligibility of all new employees that they hire during the term of their contracts under Executive Order 11-116, signed by the Governor of Florida on May 27, 2011.

- (a) E-Verify is an Internet-based system that allows businesses to determine the eligibility of their employees to work in the United States. A contractor or subcontractor that has not signed up for E-Verify and executed a memorandum of understanding with the Department of Homeland Security can enroll in the E-Verify system on the Department of Homeland Security’s website listed below:

<http://www.uscis.gov/e-verify/e-verify-enrollment-page>

- (b) Contractors and subcontractors shall enroll in the E-Verify system prior to hiring any new employee after the effective date of their contracts to perform work on CDBG-funded projects. The address for obtaining an Employer Memorandum of Understanding is:

[http://www.uscis.gov/sites/default/files/USCIS/Verification/E-Verify/E-Verify Native Documents/MOU for E-Verify Employer.pdf](http://www.uscis.gov/sites/default/files/USCIS/Verification/E-Verify/E-Verify%20Native%20Documents/MOU%20for%20E-Verify%20Employer.pdf)

- (c) The Department of Homeland Security offers tutorials and other assistance at the web address below:

<http://www.uscis.gov/e-verify/you-start>

**CDBG Supplemental Conditions for Construction Contracts**

Appendix  
Minority Participation Goals

These are the goals, by county, for meeting the minority participation portion of Section 7-B(2)(b) of the CDBG Supplemental Conditions. These are contractor workforce goals, not goals for subcontracting to minority and women firms. Solicitation of minority and women firms as subcontractors is a separate federal requirement which the contractor must document compliance with.

<u>Tampa-St. Petersburg Area</u>	<u>Percentage</u>
Hillsborough, Pinellas, Pasco.....	17.9
Charlotte, Citrus, Collier, DeSoto,.....	17.1
Hardee, Hernando, & Highlands (all seven counties)	
Lee.....	15.3
Manatee.....	15.9
Polk.....	18.0
Sarasota.....	10.5
 <u>Tallahassee Area</u>	
Leon, Wakulla.....	24.3
Calhoun, Franklin, Gadsden, Jackson,.....	29.5
Jefferson, Liberty, Madison, & Taylor (all eight counties)	
 <u>Pensacola - Panama City Area</u>	
Bay.....	14.1
Escambia, Santa Rosa.....	18.3
Gulf, Holmes, Okaloosa,.....	15.4
Walton, & Washington (all five counties)	
 <u>Jacksonville Area</u>	
Alachua.....	20.6
Baker, Clay, Duval, Nassau, & St. Johns.....	21.8
Bradford, Columbia, Dixie, Gilchrist.....	22.2
Hamilton, Lafayette, Levy, Marion, Putnam, Suwannee, & Union (all 11 counties)	
 <u>Orlando - Daytona Beach Area</u>	
	<u>Percentage</u>
Volusia.....	15.7
Brevard.....	10.7
Orange, Osceola, & Seminole (all three counties).....	15.5
Flagler, Lake, & Sumter (all three counties).....	14.9
 <u>Miami - Fort Lauderdale Area</u>	
Dade.....	39.5
Broward.....	15.5
Palm Beach.....	22.4
Glades, Hendry, Indian River, Monroe,.....	30.4
Okechobee, Martin, & St. Lucie (all seven counties)	

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This content is from the eCFR and is authoritative but unofficial.

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## **Title 2 – Grants and Agreements**

### **Subtitle A – Office of Management and Budget Guidance for Grants and Agreements**

#### **Chapter II – Office of Management and Budget Guidance**

#### **Part 200 – Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards**

- Source:** 85 FR 49543, Aug. 13, 2020, unless otherwise noted.  
**Source:** 85 FR 49539, Aug. 13, 2020, unless otherwise noted.  
**Authority:** 31 U.S.C. 503  
**Source:** 78 FR 78608, Dec. 26, 2013, unless otherwise noted.

#### **Appendix II to Part 200—Contract Provisions for Non-Federal Entity Contracts Under Federal Awards**

In addition to other provisions required by the Federal agency or non-Federal entity, all contracts made by the non-Federal entity under the Federal award must contain provisions covering the following, as applicable.

- (A) Contracts for more than the simplified acquisition threshold, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.
- (B) All contracts in excess of \$10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement.
- (C) Equal Employment Opportunity. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of “federally assisted construction contract” in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, “Equal Employment Opportunity” (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” and implementing regulations at 41 CFR part 60, “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor.”
- (D) Davis-Bacon Act, as amended (40 U.S.C. 3141-3148). When required by Federal program legislation, all prime construction contracts in excess of \$2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, “Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction”). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part

3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). The Act provides that each contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

- (E) Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.
- (F) Rights to Inventions Made Under a Contract or Agreement. If the Federal award meets the definition of “funding agreement” under 37 CFR § 401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that “funding agreement,” the recipient or subrecipient must comply with the requirements of 37 CFR Part 401, “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements,” and any implementing regulations issued by the awarding agency.
- (G) Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended—Contracts and subgrants of amounts in excess of \$150,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).
- (H) Debarment and Suspension (Executive Orders 12549 and 12689)—A contract award (see 2 CFR 180.220) must not be made to parties listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.
- (I) Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)—Contractors that apply or bid for an award exceeding \$100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any

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other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

(J) See § 200.323.

(K) See § 200.216.

(L) See § 200.322.

*[78 FR 78608, Dec. 26, 2013, as amended at 79 FR 75888, Dec. 19, 2014; 85 FR 49577, Aug. 13, 2020]*



### Certification Regarding Debarment, Suspension, and Other Responsibility Matters (Primary Covered Transactions)

April, 2015

Recipient: \_\_\_\_\_ Contract Number: \_\_\_\_\_

Name of Company Selected as a Prime Contractor: \_\_\_\_\_

DUNS Number: \_\_\_\_\_

- 1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
  - (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
  - (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
  - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1)(b) of this certification; and
  - (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- (2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name Typed

\_\_\_\_\_  
Title

\_\_\_\_\_  
Street Address

\_\_\_\_\_  
City, State, Zip

(24 CFR 24.510 and 24 CFR, Part 24, Appendix A)



# Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion (Subcontractor)

April, 2015

Recipient: \_\_\_\_\_ Contract Number: \_\_\_\_\_

Name of Subcontractor: \_\_\_\_\_

DUNS Number: \_\_\_\_\_

### Lower Tier Covered Transactions

- (1) The prospective lower tier participant certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective lower tier participant is unable to certify to the above statement, the prospective participant shall attach an explanation to this form.

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name Typed

\_\_\_\_\_  
Title

\_\_\_\_\_  
Street Address

\_\_\_\_\_  
City, State, Zip

(24 CFR 24.510 and 24 CFR, Part 24, Appendix A)

Local Government: \_\_\_\_\_ CDBG Contract #: \_\_\_\_\_

*Use a separate form for each prime contractor hired under the CDBG subgrant.*

A construction contract is expected to be awarded to the contractor listed below. Please advise whether the prime contractor is identified on the List of Parties Excluded from Federal Procurement Programs.

Prime Contractor	Bid Amount	\$	Wage Decision Information	
			Number	Modification
Name:	Bid Date		FL	
DUNS #:	Award Date		FL	
	Contract Execution Date		FL	

Describe the construction work to be performed:

List any subcontractors that will be working under the prime contract:

1)	4)
2)	5)
3)	6)

A. Is there additional work to be bid?	<input type="checkbox"/> Yes* <input type="checkbox"/> No
B. Is contract award to the apparent low bidder?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
C. After bid opening, was any bidder allowed to modify his bid, or was the project changed in any way?	<input type="checkbox"/> Yes* <input type="checkbox"/> No
D. Was any bidder rejected or allowed to withdraw after bid opening?	<input type="checkbox"/> Yes* <input type="checkbox"/> No
E. If there is only one bid, is it within the estimate or do the files document that the bid is reasonable?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
F. Has the prime contractor documented efforts to obtain minority and women subcontractors as required by 24 CFR 85.36(e)(2)(vi)? (Documentation of efforts must be retained in project files for review and reporting purposes.)	<input type="checkbox"/> Yes <input type="checkbox"/> No*
G. Did any party (bidder, sub, or supplier) file a protest? (Subgrantees must have written protest procedures.)	<input type="checkbox"/> Yes* <input type="checkbox"/> No

*\* For these situations, please provide details on a separate sheet of paper. It is recommended that the subgrant administrator discuss this with CDBG staff before the contract is awarded to ensure compliance with procurement regulations.*

\_\_\_\_\_  
Name Signature Date



### Section 3 Participation Report (Construction Prime Contractor)

April, 2015

Local Government: \_\_\_\_\_ CDBG Contract #: \_\_\_\_\_

*This form must be completed by the prime contractor for any construction contract over \$100,000. Voluntary reporting for contracts under \$100,000 is encouraged.*

Contractor's Name: \_\_\_\_\_

Contractor's DUNS Number: \_\_\_\_\_ Contract Amount: \$ \_\_\_\_\_

1. Does the business qualify as a "Section 3 Business Concern" because	
a) It is at least <u>51% owned</u> by Section 3 residents*, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
b) At least 30% of its <u>permanent full-time employees</u> are	
i) Currently Section 3 residents*, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
ii) Were Section 3 residents* within first three years of employment, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
c) Will at least 25% (dollar value) of construction subcontracts (no material/supplies/equipment vendors unless they are also installing same) be to businesses meeting (a) or (b) above?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If <b>yes</b> , list any Section 3 subcontractors and subcontract amount:	
Subcontractors	Subcontract Amount
	\$
	\$
	\$
2. Will the contractor be hiring any additional staff (office or field) for this project?	
<input type="checkbox"/> Yes <input type="checkbox"/> No	
• If <b>yes</b> , what types of jobs will be filled, and how many additional hires are estimated in each job type?	

**\*Section 3 resident means:**

- (1) A public housing resident; or
- (2) An individual who resides in the metropolitan area or nonmetropolitan county in which the section 3 covered assistance is expended, and who is:
  - (i) *A low-income person*, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act defines this term to mean families (including single persons) whose incomes do not exceed 80 per centum of the median income for the area, as determined by the Secretary, with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 80 per centum of the median for the area on the basis of the Secretary's findings that such variations are necessary because of prevailing levels of construction costs or unusually high or low-income families; or
  - (ii) *A very low-income person*, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)) defines this term to mean families (including single persons) whose incomes do not exceed 50 per centum of the median family income for the area, as determined by the Secretary with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 50 per centum of the median for the area on the basis of the Secretary's findings that such variations are necessary because of unusually high or low family incomes.
- (3) A person seeking the training and employment preference provided by section 3 bears the responsibility of providing evidence (if requested) that the person is eligible for the preference.

Note: This contract is funded with federal funds, and this information is required for construction contracts over \$100,000 for reporting purposes. See Section 3 portion of **CDBG Supplemental Conditions for Construction Projects** for additional information.



### Section 3 Participation Report (Construction Subcontractor)

April, 2015

Local Government: \_\_\_\_\_ CDBG Contract #: \_\_\_\_\_

*This form must be completed by construction subcontractors when the prime contract is at least \$100,000. (Do not include the cost of equipment or material supplies unless you are installing also.) Voluntary reporting is encouraged when the prime contract is under \$100,000.*

Subcontractor's Name: \_\_\_\_\_

Subcontractor's DUNS Number: \_\_\_\_\_ Subcontract Amount: \$ \_\_\_\_\_

1. Does the business qualify as a "Section 3 Business Concern" because	
a) It is at least <u>51% owned</u> by Section 3 residents*, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
b) At least 30% of its <u>permanent full-time employees</u> are	
i) Currently Section 3 residents*, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
ii) Were Section 3 residents* within first three years of employment, or	<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Will the subcontractor be hiring any additional staff (office or field) for this project?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> <li>If <b>yes</b>, what types of jobs (e.g., laborer, equipment operator) will be filled, and how many additional hires are estimated in each job type?</li> </ul>	

**\*Section 3 resident** means:

- (1) A public housing resident; or
- (2) An individual who resides in the metropolitan area or nonmetropolitan county in which the section 3 covered assistance is expended, and who is:
  - (i) A **low-income person**, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act defines this term to mean families (including single persons) whose incomes do not exceed 80 per centum of the median income for the area, as determined by the Secretary, with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 80 per centum of the median for the area on the basis of the Secretary's findings that such variations are necessary because of prevailing levels of construction costs or unusually high or low-income families; or
  - (ii) A **very low-income person**, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)) defines this term to mean families (including single persons) whose incomes do not exceed 50 per centum of the median family income for the area, as determined by the Secretary with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 50 per centum of the median for the area on the basis of the Secretary's findings that such variations are necessary because of unusually high or low family incomes.
- (3) A person seeking the training and employment preference provided by section 3 bears the responsibility of providing evidence (if requested) that the person is eligible for the preference.

**Note:** This contract is funded with federal funds, and this information is required for reporting purposes for projects costing over \$100,000. See Section 3 portion of **CDBG Supplemental Conditions for Construction Contracts** for additional information.



# Documentation for Business Claiming Section 3 Status

Name of Business: \_\_\_\_\_

DUNS Number of Business: \_\_\_\_\_

Address of Business: \_\_\_\_\_

- Type of Business:
- |                                              |                                        |
|----------------------------------------------|----------------------------------------|
| <input type="checkbox"/> Corporation         | <input type="checkbox"/> Partnership   |
| <input type="checkbox"/> Sole Proprietorship | <input type="checkbox"/> Joint Venture |

**Attached is the following documentation as evidence of our Section 3 status:**

\_\_\_\_\_

**For a business claiming status as a Section 3 resident-owned enterprise**

- |                                                                                           |                                                               |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| <input type="checkbox"/> Copy of resident lease                                           | <input type="checkbox"/> Copy of receipt of public assistance |
| <input type="checkbox"/> Copy of evidence of participation in a public assistance program | <input type="checkbox"/> Other evidence                       |

\_\_\_\_\_

**For a business claiming Section 3 status by subcontracting 25 percent of the dollar amount awarded to qualified Section 3 businesses**

- List of Section 3 subcontractor(s) and subcontract amount(s).

\_\_\_\_\_

**For a business claiming Section 3 status based on at least 30 percent of their workforce currently qualifying as Section 3 residents or having been qualified as Section 3 eligible residents within three years of date of first employment with the business**

- List of all current full-time employees, and
- List of employees claiming Section 3 status and for each such employee:
- PHA/IHA Residential lease less than three years from date of employment, or
  - Other evidence of Section 3 status less than three years from day of employment.

I certify that the above information is correct.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Type Name and Title

\_\_\_\_\_  
Date

**Note:** The local government shall maintain this form and supporting documentation in the CDBG project files for review during monitoring.

**C-538**  
**SECTION 3 CONTRACT CLAUSE**

All Section 3 covered contracts and subcontracts must include the following clause:

- I. The work to be performed under this contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 USC.1701u (Section 3). The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance, or HUD-assisted projects covered by Section 3, shall to the greatest extent feasible be directed to low and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- II. The parties to this contract agree to comply with HUD's regulations in 24 CFR part 75, which implement Section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 75 regulations.
- III. The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this Section 3 Clause and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the Section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
- IV. The contractor agrees to include this Section 3 Clause in every subcontract subject to compliance with regulations in 24 CFR part 75, and agrees to take appropriate actions, as provided in an applicable provision of the subcontract or in this Section 3 Clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 75. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 75.
- V. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 75 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 75.
- VI. Noncompliance with HUD's regulations in 24 CFR part 75 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- VII. With respect to work performed in connection with Section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 USC 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of Section 3 and section 7(b) agree to comply with Section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

**C-539**  
**Wage Decision**

"General Decision Number: FL20250017 12/12/2025

Superseded General Decision Number: FL20240017

State: Florida

Construction Type: Building

County: Jackson County in Florida.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Modification Number	Publication Date
0	01/03/2025
1	09/19/2025
2	12/12/2025

ENGI0653-010 10/01/2023

Rates                      Fringes

OPERATOR: Crane		
100 Tons & Over		
(Conventional & Hydraulic)		
& Tower Cranes.....	\$ 32.75	14.55
Under 100 Tons.....	\$ 30.25	14.55

Cranes with 350 feet or more boom and/or 400 ton capacity - additional \$1.10 per hour.

Cranes with 500 feet boom and/or 600 ton capacity - additional \$1.45 per hour.

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IRON0798-007 07/01/2025

Rates                      Fringes

IRONWORKER, STRUCTURAL AND REINFORCING.....	\$ 32.00	18.77
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SUFL2009-054 05/22/2009

Rates                      Fringes

CARPENTER.....	\$ 12.29	0.27
CEMENT MASON/CONCRETE FINISHER...	\$ 9.50	0.00
ELECTRICIAN.....	\$ 14.67	0.00
LABORER: Common or General.....	\$ 7.75	0.00
LABORER: Pipelayer.....	\$ 11.42	1.95
OPERATOR: Backhoe/Excavator.....	\$ 12.43	0.00
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 9.58	0.00
PAINTER: Brush, Roller and Spray.....	\$ 10.10	0.00

PLASTERER.....	\$ 15.90	0.00
PLUMBER.....	\$ 10.48	2.06
ROOFER: Built Up, Composition, Hot Tar and Single Ply.....	\$ 12.00	0.00
SHEET METAL WORKER, Includes HVAC Duct Installation.....	\$ 11.72	2.19
TRUCK DRIVER, Includes Dump and 10 Yard Haul Away.....	\$ 8.00	0.15

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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  
<https://www.dol.gov/agencies/whd/government-contracts>.

Note: Executive Order 13658 generally applies to contracts  
subject to the Davis-Bacon Act that were awarded on or between  
January 1, 2015 and January 29, 2022, and that have not been  
renewed or extended on or after January 30, 2022. Executive  
Order 13658 does not apply to contracts subject only to the  
Davis-Bacon Related Acts regardless of when they were awarded.  
If a contract is subject to Executive Order 13658, the  
contractor must pay all covered workers at least \$13.30 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 2025. The applicable Executive Order  
minimum wage rate will be adjusted annually. Additional  
information on contractor requirements and worker protections  
under Executive Order 13658 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) (iii)).

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The body of each wage determination lists the classifications

and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

#### Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate 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. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

#### Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

#### Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the 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. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

## State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

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## WAGE DETERMINATION APPEALS PROCESS

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

- a) a survey underlying a wage determination
- b) an existing published wage determination
- c) an initial WHD letter setting forth a position on a wage determination matter
- d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to [davisbaconinfo@dol.gov](mailto:davisbaconinfo@dol.gov) or by mail to:

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

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to [BCWD-Office@dol.gov](mailto:BCWD-Office@dol.gov) or by mail 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 an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to [dba.reconsideration@dol.gov](mailto:dba.reconsideration@dol.gov) or by mail 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 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.

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END OF GENERAL DECISION"

**A. APPLICABILITY**

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

**1. Minimum wages and fringe benefits**

- i. All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), 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 basic hourly 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. As provided in 29 CFR 5.5(d) and (e), the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act (40 U.S.C. 3141(2)(B)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(v) of these contract clauses; 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 must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in 29 CFR 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 classifications and wage rates conformed under 29 CFR 5.5(a)(1)(iii)) and the Davis-Bacon poster (WH-1321) must 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. Frequently recurring classifications**

- A. In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in 29 CFR part 1, a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to 29 CFR 5.5(a)(1)(iii), provided that:
  1. The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;
  2. The classification is used in the area by the construction industry; and
  3. The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.
- B. The Administrator will establish wage rates for such classifications in accordance with 29 CFR 5.5(a)(1)(iii)(A)(3). Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

**iii. Conformance**

- A. The contracting officer must require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract be

classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate 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 used 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. The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.
  - C. If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken will be sent by the contracting officer by email to [DBAconformance@dol.gov](mailto:DBAconformance@dol.gov). The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
  - D. In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer will, by email to [DBAconformance@dol.gov](mailto:DBAconformance@dol.gov), refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
  - E. The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division under 29 CFR 5.5 (a)(1)(iii)(C) and (D). The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to 29 CFR 5.5 (a)(1)(iii)(C) or (D) must 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.

**iv. Fringe benefits not expressed as an hourly rate**

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 may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

**v. Unfunded plans**

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, in accordance with the criteria set forth in 29 CFR 5.28, 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.

- vi. Interest** In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

## 2. Withholding

### i. Withholding requirements

The U. S. Department of Housing and Urban Development may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in 29 CFR 5.5(a) for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in 29 CFR 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work (or otherwise working in construction or development of the project under a development statute) all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in 29 CFR 5.5(a)(3)(iv), HUD may on its own initiative and after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, 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.

### ii. Priority to withheld funds

The Department has priority to funds withheld or to be withheld in accordance with 29 CFR 5.5(a)(2)(i) or (b)(3)(i), or both, over claims to those funds by:

- A. A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- B. A contracting agency for its procurement costs;
- C. A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- D. A contractor's assignee(s);
- E. A contractor's successor(s); or
- F. A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901-3907.

## 3. Records and certified payrolls

### i. Basic record requirements

**A. Length of record retention.** All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

**B. Information required** Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; 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 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

**C. Additional records relating to fringe benefits.** Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(v) 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 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act, the contractor must 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.

**D. Additional records relating to apprenticeship** Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

**ii. Certified payroll requirements**

**A. Frequency and method of submission** The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to HUD if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the certified payrolls to the applicant, sponsor, owner, or other entity, as the case may be, that maintains such records, for transmission to HUD. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system

**B. Information required** The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i)(B), except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (*e.g.*, the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH-347 or in any other format desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347.pdf> or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the sponsoring government agency (or the applicant, sponsor, owner, or other entity, as the case may be, that maintains such records).

**C. Statement of Compliance** Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

1. That the certified payroll for the payroll period contains the information required to be provided under 29 CFR 5.5(a)(3)(ii), the appropriate information and basic records are being maintained under 29 CFR 5.5 (a)(3)(i), and such information and records are correct and complete;
2. That each laborer or mechanic (including each helper and apprentice) working 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; and

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(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.
  - D. **Use of Optional Form WH-347** The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 will satisfy the requirement for submission of the “Statement of Compliance” required by 29 CFR 5.5(a)(3)(ii)(C).
  - E. **Signature** The signature by the contractor, subcontractor, or the contractor’s or subcontractor’s agent must be an original handwritten signature or a legally valid electronic signature.
  - F. **Falsification** The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 3729.
  - G. **Length of certified payroll retention** The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.
- iii. **Contracts, subcontracts, and related documents** The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.
- iv **Required disclosures and access**
- A. **Required record disclosures and access to workers** The contractor or subcontractor must make the records required under 29 CFR 5.5(a)(3)(i)–(iii), and any other documents that HUD or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by 29 CFR 5.1, available for inspection, copying, or transcription by authorized representatives of HUD or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.
  - B. **Sanctions for non-compliance with records and worker access requirements** If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, 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, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to 29 CFR 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under 29 CFR part 6 any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.
  - C. **Required information disclosures** Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to HUD if the agency is a party to

the contract, or to the Wage and Hour Division of the Department of Labor. If the Federal agency is not such a party to the contract, the contractor, subcontractor, or both, must, upon request, provide the full Social Security number and last known address, telephone number, and email address of each covered worker to the applicant, sponsor, owner, or other entity, as the case may be, that maintains such records, for transmission to HUD, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

#### 4. **Apprentices and equal employment opportunity**

##### i. **Apprentices**

- A. **Rate of pay** Apprentices will be permitted to work at less than the predetermined rate for the work they perform 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, Office of Apprenticeship (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- B. **Fringe benefits** Apprentices must 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, fringe benefits must be paid in accordance with that determination.
- C. **Apprenticeship ratio** The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to 29 CFR 5.5(a)(4)(i)(D). Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in 29 CFR 5.5(a)(4)(i)(A), must 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 this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.
- D. **Reciprocity of ratios and wage rates** Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

- ii **Equal employment opportunity** The use of apprentices and journeyworkers under this part must 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 must insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (11), along with the applicable wage determination(s) and such other clauses or contract modifications as the U.S. Department of Housing and Urban Development may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate.

**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 the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

**10. Certification of eligibility.**

i. By entering into this contract, the contractor certifies that neither it 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 40 U.S.C. 3144(b) or 29 CFR 5.12(a).

ii. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b) or 29 CFR 5.12(a).

iii. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, 18 U.S.C. 1001.

**11 Anti-retaliation** It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

i. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, or 29 CFR parts 1, 3, or 5;

ii. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, or 29 CFR parts 1, 3, or 5;

iii. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, or 29 CFR parts 1, 3, or 5; or

iv. Informing any other person about their rights under the DBA, Related Acts, or 29 CFR parts 1, 3, or 5.

**B. Contract Work Hours and Safety Standards Act (CWHSSA)**

The Agency Head must cause or require the contracting officer to insert the following clauses set forth in 29 CFR 5.5(b)(1), (2), (3), (4), and (5) in full, or (for contracts covered by the Federal Acquisition Regulation) by reference, in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses must

be inserted in addition to the clauses required by 29 CFR 5.5(a) or 4.6. As used in this paragraph, the terms “laborers and mechanics” include watchpersons 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 29 CFR 5.5(b)(1) the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. 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 watchpersons and guards, employed in violation of the clause set forth in 29 CFR 5.5(b)(1), in the sum of \$31 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 29 CFR 5.5(b)(1).

**3. Withholding for unpaid wages and liquidated damages**

**i. Withholding process** The U.S Department of Housing and Urban Development or the recipient of Federal assistance may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in 29 CFR 5.5(b) on this contract, 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 that is held by the same prime contractor (as defined in 29 CFR 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

**ii Priority to withheld funds** The Department has priority to funds withheld or to be withheld in accordance with 29 CFR 5.5(a)(2)(i) or (b)(3)(i), or both, over claims to those funds by:

**A.** A contractor’s surety(ies), including without limitation performance bond sureties and payment bond sureties;

**B.** A contracting agency for its procurement costs;

**C.** A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor’s bankruptcy estate;

**D.** A contractor’s assignee(s);

**E.** A contractor’s successor(s); or

**F.** A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901-3907.

**4. Subcontracts.** The contractor or subcontractor must insert in any subcontracts the clauses set forth in 29 CFR 5.5(b)(1) through (5) and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in 29 CFR 5.5(b)(1) through (5). In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss,

due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

- 5 Anti-retaliation** It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:
- i. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in 29 CFR part 5;
  - ii. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or 29 CFR part 5;
  - iii. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or 29 CFR part 5; or
  - iv. Informing any other person about their rights under CWHSSA or 29 CFR part 5.
- C. CWHSSA required records clause** In addition to the clauses contained in 29 CFR 5.5(b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other laws referenced by 29 CFR 5.1, the Agency Head must cause or require the contracting officer to insert a clause requiring that the contractor or subcontractor must maintain regular payrolls and other basic records during the course of the work and must preserve them for a period of 3 years after all the work on the prime contract is completed for all laborers and mechanics, including guards and watchpersons, working on the contract. Such records must contain the name; last known address, telephone number, and email address; and social security number of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid; daily and weekly number of hours actually worked; deductions made and actual wages paid. Further, the Agency Head must cause or require the contracting officer to insert in any such contract a clause providing that the records to be maintained under this paragraph must be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview workers during working hours on the job.
- D. Incorporation of contract clauses and wage determinations by reference** Although agencies are required to insert the contract clauses set forth in this section, along with appropriate wage determinations, in full into covered contracts, and contractors and subcontractors are required to insert them in any lower-tier subcontracts, the incorporation by reference of the required contract clauses and appropriate wage determinations will be given the same force and effect as if they were inserted in full text.
- E. Incorporation by operation of law** The contract clauses set forth in this section (or their equivalent under the Federal Acquisition Regulation), along with the correct wage determinations, will be considered to be a part of every prime contract required by the applicable statutes referenced by 29 CFR 5.1 to include such clauses, and will be effective by operation of law, whether or not they are included or incorporated by reference into such contract, unless the Administrator grants a variance, tolerance, or exemption from the application of this paragraph. Where the clauses and applicable wage determinations are effective by operation of law under this paragraph, the prime contractor must be compensated for any resulting increase in wages in accordance with applicable law.

## **F. HEALTH AND SAFETY**

The provisions of this paragraph (F) are applicable where the amount of the prime contract exceeds **\$100,000**.

1. No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his or her health and safety, as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.
2. The contractor shall comply with all regulations issued by the Secretary of Labor pursuant to 29 CFR Part 1926 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), 40 U.S.C. § 3701 et seq.
3. The contractor shall include the provisions of this paragraph in every subcontract, so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

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**ADDITIONAL CDBG-DR REGULATIONS**

- a) The Temporary Assistance for Needy Families Program ('TANF'), 45 CFR Parts 260-265, the Social Services Block Grant ("SSBG"), 42 U.S.C. 1397d, and other applicable federal regulations and policies promulgated thereunder.
- b) Title IX of the Education Amendments of 1972, as amended. 20 U.S.C. 1681, et seq., which prohibits discrimination on the basis of sex in educational programs.
- c) Section 654 of the Omnibus Budget Reconciliation Act of 1981, as amended, 42 U.S.C. 9849, which prohibits discrimination on the basis of race, creed, color, national origin, sex, handicap, political affiliation or beliefs.
- d) The Pro-Children Act: Contractor agrees to comply with the Pro-Children Act of 1994, 20 U.S.C. 6083. Failure to comply with the provisions of the law may result in the imposition of civil monetary penalty up to \$1,000 for each violation and/or the imposition of an administrative compliance order on the responsible entity. This clause is applicable to all approved sub-contracts. In compliance with Public Law (Pub. L.) 103—277, the Contract shall not permit smoking in any portion of any indoor facility used for the provision of federally funded services including health, day care, early childhood development, education or library services on a routine or regular basis, to children up to age 18.
- e) It is envisioned that this project will be funded (75%) with Federal funds from the Hazard Mitigation Grant Program, the current construction budget available for this project is \$52,484.25. Additionally, it is envisioned that this project will be funded (25%) with Federal funds from the United States Department of Housing and Urban Development (Community Development Block Grant for Disaster Recovery CDBG-DR) and therefore is subject to the Federal laws and regulations associated with that program. Specifically, under the Town's Grant No. M0186 the current construction budget is \$17,494.75.
- f) Purchase of American-Made Equipment and Products: Contractor assures that, to the greatest extent possible, all equipment and products purchased with funds made available under this Agreement will be American-made.
- g) The Consolidated Appropriations Act, 2010, Division E, Section 511 (Pub. L. 111-117), which prohibits distribution of federal funds made available under the Act to the Association of Community Organizations for Reform Now (ACORN) or its subsidiaries. The Continuing Appropriations Act, 2011, Sections 101 and 103 (Pub. L. 111-242), provides that appropriations made under Pub. L. 111-117 are available under the conditions provided by Pub. L. 111-117.
- h) Resource Conservation and Recovery Act (RCRA). Under RCRA (Pub. L. 94-580 codified at 42 U.S.C.6962), state and local institutions of higher education, hospitals, and non-profit organizations that receive direct Federal awards or other Federal funds shall give preference in their procurement programs funded with Federal funds to the purchase of recycled products pursuant to the EPA guidelines.
- i) Immigration Reform and Control Act. Contractor shall comply with the requirements of the Immigration Reform and Control Act of 1986, which requires employment verification and retention of verification forms for any individuals who will perform any services under the contract.

My signature below verifies that I have read, understood, and agree to abide by the regulations as outlined above.

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Signature of Contractor's Authorized Official

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**ADDITIONAL CDBG-DR REGULATIONS**

\_\_\_\_\_  
Name and Title of Contractor's Authorized Official

\_\_\_\_\_  
Date

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Throughout the performance of any work under this Agreement, CONTRACTOR (hereinafter "CONTRACTOR") agrees to abide by the following clauses and requirements:

**1. REMEDIES/DISPUTE RESOLUTION/VENUE/CONSTRUCTION**

Governing State Law/Severability/Venue/Waiver of Jury Trial. The rights, obligations and remedies of the parties as specified under the Contract shall be interpreted and governed in all aspects by the laws of the State of Florida. Should any provision of the Contract be determined by the courts to be illegal, unenforceable or in conflict with any applicable law, the validity of the remaining provisions shall not be impaired. Venue for litigation of the Contract shall be exclusively in courts of competent jurisdiction located in Jackson County, Florida. The parties waive any and all rights to a jury trial with respect to disputes arising under the Contract.

**2. TERMINATION FOR CAUSE AND CONVENIENCE**

The County/City/Town may terminate this Agreement without cause, by giving the Contractor written notice of termination. Either party may terminate this Agreement for cause by giving the other party hereto written notice of termination. Termination, with and without cause, shall be effective immediately. In the event of a termination, the Contractor shall be compensated for work satisfactorily completed and irrevocable commitments made prior to such termination. No cancellation fees will be compensated.

**3. EQUAL EMPLOYMENT OPPORTUNITY**

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

- 1) 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.
- 2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.
- 3) The contractor will send to each labor union or representative of workers with which he 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 under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- 4) 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.
- 5) 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 his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- 6) 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 as may be imposed and remedies invoked as

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**HMGP Contract Provisions**

provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

7) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) 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 administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, That in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

**4. DAVIS BACON ACT**

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

- 1) All transactions regarding this contract shall be done in compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) and the requirements of 29 C.F.R. pt. 5 as may be applicable. The contractor shall comply with 40 U.S.C. 3141-3144, and 3146-3148 and the requirements of 29 C.F.R pt. 5 as applicable.
- 2) Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.
- 3) Additionally, contractors are required to pay wages not less than once a week.
- 4) Contractor shall be required to request additional classifications that are not represented in the Wage Rate but will complete work on the project. The following wage rates shall apply, but not be limited to, the classifications needed for this project:

Wage Decision included dated January 2025.

Contractor shall complete the required Department of Commerce Wage Rate Request form which shall be forwarded to the Town Engineer/Representative. The Town/Town Representative shall forward all additional requests to FC-CDBG to be processed to the Department of Labor (USDOL). Any payroll payment that does not meet the required DOL Wage Rates determined for each classification must be reimbursed by the contractor to the employees.

By accepting this contract, the Contractor accepts knowledge that additional classifications must be requested from USDOL as part of the contract bid price of this project.

**5. COPELAND ANTI-KICKBACK ACT**

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

- 1) Contractor – The Contractor shall comply with 18 U.S.C. 874, 40 U.S.C 3145, and the requirements of 29 C.F.R pt. 3 as may be applicable, which are incorporated by reference into this contract.
- 2) Subcontracts – The contractor or subcontractor shall insert in any subcontracts the clauses above and such other clauses as the Department of Economic Opportunity requires and 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 of these contract clauses.
- 3) Breach – A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. 5.12

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**6. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT**

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

(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 paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor 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 paragraph (b)(1) of this section, in the sum of \$27 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 paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The Owner 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 paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section 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 paragraphs (b)(1) through (4) of this section.

**7. RIGHTS TO INVENTIONS - Not applicable to this agreement.**

If the Federal award meets the definition of "funding agreement" under 37 CFR § 401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

**8. CLEAN AIR ACT**

The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq, when applicable, the Contractor agrees to report each violation to the County and State of Florida and understands and agrees that the State will, in turn, report each violation as required to assure notification to the appropriate State and Federal grantors and grantees, and the appropriate Environmental Protection Agency Regional Office. The Contractor agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with

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Federal assistance provided by FEMA.

**9. FEDERAL WATER POLLUTION CONTROL ACT**

The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. The Contractor agrees to report each violation to the County and State of Florida and understands and agrees that the State will, in turn, report each violation as required to assure notification to the appropriate State and Federal grantors and grantees, the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office. The Contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FEMA.

**10. DEBARMENT AND SUSPENSION**

This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such the contractor is required to verify that none of the contractor, its principals (defined at 2 C.F.R. § 180.995), or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935). The contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into. This certification is a material representation of fact relied upon by the County and State of Florida. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to all State of Florida, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment. The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

**11. PROCUREMENT OF RECOVERED MATERIALS.**

(1) In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA- designated items unless the product cannot be acquired— (i) Competitively within a timeframe providing for compliance with the contract performance schedule; (ii) Meeting contract performance requirements; or (iii) At a reasonable price. Information about this requirement, along with the list of EPA-designate items, is available at EPA’s Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>. The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

(2) As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award.

(b) For purposes of this section:

(1) “Produced in the United States” means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

(2) “Manufactured products” means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

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**12. DHS SEAL, LOGO, AND FLAGS**

The contractor shall not use the DHS seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific FEMA pre- approval.

**13. COMPLIANCE WITH FEDERAL LAW, REGULATIONS, AND EXECUTIVE ORDERS**

This is an acknowledgement that FEMA and HUD DEO CDBG-DR funds will financial assistance will be used to fund the contract. The contractor Will comply will all applicable federal law, regulations, executive orders, FEMA/CDBG policies, procedures, and directives.

**14. NO OBLIGATION BY FEDERAL GOVERNMENT**

The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, contractor, or any other party pertaining to any matter resulting from the contract.

**15. PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR ACTS**

The contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the contractor's actions pertaining to this contract.

**16. ACCESS TO RECORDS**

The contractor agrees to provide County, applicable State of Florida agencies, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed. The contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract. In compliance with the Disaster Recovery Act of 2018, Jackson County and the Contractor acknowledge and agree that no language in this contract is intended to prohibit audits or internal reviews by the FEMA Administrator or the Comptroller General of the United States.

**17. CHANGES AND AMENDMENTS**

All changes to, additions to, modifications of, or amendment to this Contract, or any of the terms, provisions, and conditions hereof, shall be binding only when in writing and signed by the authorized officer, agent or representative of each of the parties hereto.

**18. BYRD ANTI-LOBBYING AGREEMENT**

Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier-to-tier up to the recipient.

**BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION**

The undersigned, \_\_\_\_\_ certifies, to the best of his or her knowledge, that:

**Section C-542**  
**HMGP Contract Provisions**

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 et seq., apply to this certification and disclosure, if any.

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Signature of Contractor's Authorized Official

## NOTICE TO PROCEED

Owner: \_\_\_\_\_ Owner's Project No.: \_\_\_\_\_

Engineer: \_\_\_\_\_ Engineer's Project No.: \_\_\_\_\_

Contractor: \_\_\_\_\_ Contractor's Project No.: \_\_\_\_\_

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

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

Effective Date of Contract: \_\_\_\_\_

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on \_\_\_\_\_ pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

In accordance with the Agreement:

The number of days to achieve Substantial Completion is **90** consecutive calendar days from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of \_\_\_\_\_; and the number of days to achieve readiness for final payment is **120** consecutive calendar days from the commencement date of the Contract Times, resulting in a date for readiness for final payment of \_\_\_\_\_.

Before starting any Work at the Site, Contractor must comply with the following:

Paragraph 2.01 of the General Conditions provides that you and Owner must each deliver to the other (with copies to Engineer and other identified additional insureds and loss payees) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Owner: City of Cottondale

By (signature): \_\_\_\_\_

Name (printed): \_\_\_\_\_

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

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

Copy: Engineer

**PERFORMANCE BOND**

<p><b>Contractor</b></p> <p>Name: _____</p> <p>Address (<i>principal place of business</i>):</p> <p>_____</p> <p>_____</p>	<p><b>Surety</b></p> <p>Name: _____</p> <p>Address (<i>principal place of business</i>):</p> <p>_____</p> <p>_____</p>
<p><b>Owner</b></p> <p>Name: _____</p> <p>Mailing address (<i>principal place of business</i>):</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p><b>Contract</b></p> <p>Description (<i>name and location</i>):</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Contract Price: _____</p> <p>Effective Date of Contract: _____</p>
<p><b>Bond</b></p> <p>Bond Amount: _____</p> <p>Date of Bond: _____</p> <p><i>(Date of Bond cannot be earlier than Effective Date of Contract)</i></p> <p>Modifications to this Bond form:</p> <p><input type="checkbox"/> None <input type="checkbox"/> See Paragraph 16</p>	
<p>Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.</p>	
<p>Contractor as Principal</p>	<p>Surety</p>
<p>_____</p> <p><i>(Full formal name of Contractor)</i></p>	<p>_____</p> <p><i>(Full formal name of Surety) (corporate seal)</i></p>
<p>By: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>	<p>By: _____</p> <p style="text-align: center;"><i>(Signature)(Attach Power of Attorney)</i></p>
<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>	<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>
<p>Title: _____</p>	<p>Title: _____</p>
<p>Attest: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>	<p>Attest: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>
<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>	<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>
<p>Title: _____</p>	<p>Title: _____</p>
<p><i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i></p>	

## C-610

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:
  - 3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;
  - 3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
  - 3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
  - 5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
  - 5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
  - 5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or
  - 5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

## C-610

- 5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
  - 5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.
  7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
    - 7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
    - 7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
    - 7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
  8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
  9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
  10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
  11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.
  12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.
  13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such

statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

- 14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
  - 14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.
  - 14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.
  - 14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
  - 14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
16. Modifications to this Bond are as follows:

**PAYMENT BOND**

<p><b>Contractor</b></p> <p>Name: _____</p> <p>Address (<i>principal place of business</i>):                  _____                  _____</p>	<p><b>Surety</b></p> <p>Name: _____</p> <p>Address (<i>principal place of business</i>):                  _____                  _____</p>
<p><b>Owner</b></p> <p>Name: _____</p> <p>Mailing address (<i>principal place of business</i>):                  _____                  _____                  _____</p>	<p><b>Contract</b></p> <p>Description (<i>name and location</i>):                  _____                  _____</p> <p>Contract Price: _____</p> <p>Effective Date of Contract: _____</p>
<p><b>Bond</b></p> <p>Bond Amount: _____</p> <p>Date of Bond: _____                  (<i>Date of Bond cannot be earlier than Effective Date of Contract</i>)</p> <p>Modifications to this Bond form:  <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 18</p>	
<p>Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.</p>	
<p>Contractor as Principal</p>	<p>Surety</p>
<p>_____                  (<i>Full formal name of Contractor</i>)</p>	<p>_____                  (<i>Full formal name of Surety</i>) (<i>corporate seal</i>)</p>
<p>By: _____                  (<i>Signature</i>)</p>	<p>By: _____                  (<i>Signature</i>)(<i>Attach Power of Attorney</i>)</p>
<p>Name: _____                  (<i>Printed or typed</i>)</p>	<p>Name: _____                  (<i>Printed or typed</i>)</p>
<p>Title: _____</p>	<p>Title: _____</p>
<p>Attest: _____                  (<i>Signature</i>)</p>	<p>Attest: _____                  (<i>Signature</i>)</p>
<p>Name: _____                  (<i>Printed or typed</i>)</p>	<p>Name: _____                  (<i>Printed or typed</i>)</p>
<p>Title: _____</p>	<p>Title: _____</p>
<p><i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i></p>	

**C-615**

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond will arise after the following:
  - 5.1. Claimants who do not have a direct contract with the Contractor
    - 5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
    - 5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).
  - 5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
  - 7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
  - 7.2. Pay or arrange for payment of any undisputed amounts.
  - 7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. Definitions
  - 16.1. *Claim*—A written statement by the Claimant including at a minimum:
    - 16.1.1. The name of the Claimant;
    - 16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;
    - 16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
    - 16.1.4. A brief description of the labor, materials, or equipment furnished;

- 16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
  - 16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
  - 16.1.7. The total amount of previous payments received by the Claimant; and
  - 16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
- 16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic’s lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of “labor, materials, or equipment” that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor’s subcontractors, and all other items for which a mechanic’s lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
- 16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
18. Modifications to this Bond are as follows:

## CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	

This  Preliminary  Final Certificate of Substantial Completion applies to:

All Work  The following specified portions of the Work:

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Date of Substantial Completion:

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities:  None  As follows:

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Amendments to Contractor's Responsibilities:  None  As follows:

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The following documents are attached to and made a part of this Certificate:

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This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Engineer

By (*signature*): \_\_\_\_\_

Name (*printed*): \_\_\_\_\_

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

**NOTICE OF ACCEPTABILITY OF WORK**

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Notice Date:	Effective Date of the Construction Contract:

The Engineer hereby gives notice to the Owner and Contractor that Engineer recommends final payment to Contractor, and that the Work furnished and performed by Contractor under the Construction Contract is acceptable, expressly subject to the provisions of the Construction Contract's Contract Documents ("Contract Documents") and of the Agreement between Owner and Engineer for Professional Services dated \_\_\_\_\_ ("Owner-Engineer Agreement"). This Notice of Acceptability of Work (Notice) is made expressly subject to the following terms and conditions to which all who receive and rely on said Notice agree:

1. This Notice has been prepared with the skill and care ordinarily used by members of the engineering profession practicing under similar conditions at the same time and in the same locality.
2. This Notice reflects and is an expression of the Engineer's professional opinion.
3. This Notice has been prepared to the best of Engineer's knowledge, information, and belief as of the Notice Date.
4. This Notice is based entirely on and expressly limited by the scope of services Engineer has been employed by Owner to perform or furnish during construction of the Project (including observation of the Contractor's Work) under the Owner-Engineer Agreement, and applies only to facts that are within Engineer's knowledge or could reasonably have been ascertained by Engineer as a result of carrying out the responsibilities specifically assigned to Engineer under such Owner-Engineer Agreement.
5. This Notice is not a guarantee or warranty of Contractor's performance under the Construction Contract, an acceptance of Work that is not in accordance with the Contract Documents, including but not limited to defective Work discovered after final inspection, nor an assumption of responsibility for any failure of Contractor to furnish and perform the Work thereunder in accordance with the Contract Documents, or to otherwise comply with the Contract Documents or the terms of any special guarantees specified therein.
6. This Notice does not relieve Contractor of any surviving obligations under the Construction Contract, and is subject to Owner's reservations of rights with respect to completion and final payment.

Engineer

By *(signature)*: \_\_\_\_\_

Name *(printed)*: \_\_\_\_\_

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

**C-650**

RELEASE OF LIEN

STATE OF FLORIDA

COUNTY OF FLORIDA \_\_\_\_\_

I, \_\_\_\_\_, having been first duly sworn, do now depose and say: That all person, firms, and corporations, who have furnished services, labor, or materials for use on the \_\_\_\_\_, Florida Department of Economic Opportunity, Community Development Block Grant (CDBG), Contract No. \_\_\_\_\_, have fully completed their respective work, and it has been accepted by the Owner of said real estate; and there are no bills for labor or materials or appliances in connection with such construction which have not been paid.

\_\_\_\_\_  
Contractor's Representative

(SEAL)

Subscribed and sworn to before the undersigned, a Notary Public for the State of Florida, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

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

My commission expires \_\_\_\_\_.

**C-700**  
**STANDARD GENERAL CONDITIONS**  
**OF THE CONSTRUCTION CONTRACT**

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# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

## ARTICLE 1—DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
  3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
  4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  5. *Bidder*—An individual or entity that submits a Bid to Owner.
  6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
  7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
  8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
  9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
  10. *Claim*
    - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

- requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.
- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
  - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
  - d. A demand for money or services by a third party is not a Claim.
11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
  12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
  13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
  14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
  15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
  16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
  17. *Cost of the Work*—See Paragraph 13.01 for definition.
  18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
  19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
  20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
  21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
  - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
  - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
  - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.
32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals.
36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers’ instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
  - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
  - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

## 1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:* The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:* The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:* The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
  - 1. does not conform to the Contract Documents;
  - 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
  - 3. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
  - 1. The word “furnish,” when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  - 2. The word “install,” when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
  - 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.
  - 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2—PRELIMINARY MATTERS**

### **2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance***

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

### **2.02 *Copies of Documents***

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

### **2.03 *Before Starting Construction***

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
  - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
  - 2. a preliminary Schedule of Submittals; and
  - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.
  - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
  - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
  - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.
  - 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

## ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

### 3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
  - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
  - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

### 3.02 *Reference Standards*

- A. *Standards Specifications, Codes, Laws and Regulations*
  - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  - 2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

### 3.03 *Reporting and Resolving Discrepancies*

#### A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

#### B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
  - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
  - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

### 3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

### 3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
  - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
  - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

## **ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK**

### 4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

### 4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

### 4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

#### 4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
  - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
  - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

#### 4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
  - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
  - 2. Abnormal weather conditions;
  - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
  - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
  2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
  3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
  2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
  3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
  4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
  5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

## **ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

### **5.01 *Availability of Lands***

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
  2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
  - C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

### 5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
3. Technical Data contained in such reports and drawings.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

- C. *Reliance by Contractor on Technical Data:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

#### 5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
  2. is of such a nature as to require a change in the Drawings or Specifications;
  3. differs materially from that shown or indicated in the Contract Documents; or
  4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
  - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
  - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
- a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
  - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
  - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.
- F. *Underground Facilities; Hazardous Environmental Conditions:* Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

#### 5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
  2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
  4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
  5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
  2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
  3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
  4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
  - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
  - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
  3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
  4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

#### 5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

- of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

## **ARTICLE 6—BONDS AND INSURANCE**

### **6.01 *Performance, Payment, and Other Bonds***

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner’s termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

#### 6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- H. Contractor shall require:
  - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
  - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

#### 6.03 Contractor's Insurance

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
  - 1. include at least the specific coverages required;
  - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
  - 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
  - 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
  - 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
  - 1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
  - 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
  - 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and
5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

#### 6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

#### 6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
  2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

**ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES**

7.01 *Contractor's Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

#### 7.04 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

#### 7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
  - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
    - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
      - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
  - 3) has a proven record of performance and availability of responsive service; and
  - 4) is not objectionable to Owner.
- b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
  - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

#### 7.06 *Substitutes*

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
  2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
  - a. will certify that the proposed substitute item will:
    - 1) perform adequately the functions and achieve the results called for by the general design;
    - 2) be similar in substance to the item specified; and
    - 3) be suited to the same use as the item specified.
  - b. will state:
    - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
    - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
    - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
  - c. will identify:
    - 1) all variations of the proposed substitute item from the item specified; and
    - 2) available engineering, sales, maintenance, repair, and replacement services.
  - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

#### 7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

#### 7.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

#### 7.11 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

#### 7.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

### 7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
  - 1. all persons on the Site or who may be affected by the Work;
  - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall:
  - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - b. determine and verify:
    - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
    - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
    - 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
  - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
- 2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
    - a. Contractor shall submit the number of copies required in the Specifications.
    - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
  2. *Samples*
    - a. Contractor shall submit the number of Samples required in the Specifications.
    - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
  3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
  2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
  3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
  4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

*D. Resubmittal Procedures for Shop Drawings and Samples*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

*E. Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
  - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
  - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
  - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

- d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
  2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

**7.17 Contractor's General Warranty and Guarantee**

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
  2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
1. Observations by Engineer;
  2. Recommendation by Engineer or payment by Owner of any progress or final payment;
  3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  4. Use or occupancy of the Work or any part thereof by Owner;
  5. Any review and approval of a Shop Drawing or Sample submittal;
  6. The issuance of a notice of acceptability by Engineer;
  7. The end of the correction period established in Paragraph 15.08;
  8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.
- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
  - 1. Checking for conformance with the requirements of this Paragraph 7.19;
  - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
  - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

## **ARTICLE 8—OTHER WORK AT THE SITE**

### **8.01 *Other Work***

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

#### 8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
  - 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
  - 2. An itemization of the specific matters to be covered by such authority and responsibility; and
  - 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

#### 8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
  - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
  - 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

## **ARTICLE 9—OWNER'S RESPONSIBILITIES**

### **9.01 *Communications to Contractor***

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

### **9.02 *Replacement of Engineer***

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

### **9.03 *Furnish Data***

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

### **9.04 *Pay When Due***

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

- 9.05 *Lands and Easements; Reports, Tests, and Drawings*
- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
  - B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
  - C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.
- 9.06 *Insurance*
- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.
- 9.07 *Change Orders*
- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.
- 9.08 *Inspections, Tests, and Approvals*
- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.
- 9.09 *Limitations on Owner's Responsibilities*
- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- 9.10 *Undisclosed Hazardous Environmental Condition*
- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.
- 9.11 *Evidence of Financial Arrangements*
- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).
- 9.12 *Safety Programs*
- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
  - B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

## ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

### 10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

### 10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

### 10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

### 10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

## ARTICLE 11—CHANGES TO THE CONTRACT

### 11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

### 11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
  - 1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
  - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
  - 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
  - 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

### 11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

- B. If Owner has issued a Work Change Directive and:
  - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
  - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

#### 11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

#### 11.05 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

#### 11.06 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

#### 11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
  2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
  3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will be determined as follows:
1. A mutually acceptable fixed fee; or
  2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
    - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
    - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
    - d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
    - e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
    - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

#### 11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

#### 11.09 *Change Proposals*

A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

#### B. *Change Proposal Procedures*

1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
2. *Supporting Data:* The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
  - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
  - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

#### 11.10 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

### **ARTICLE 12—CLAIMS**

#### 12.01 *Claims*

- A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
  1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
  2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
  3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
  4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and believe the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*
  - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
  - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.
  - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

## **ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### **13.01 *Cost of the Work***

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
  - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
  2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
  3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
  4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
  5. Other costs consisting of the following:
    - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
    - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

- 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
- 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
- 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work does not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
- 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 6. Expenses incurred in preparing and advancing Claims.
- 7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

- 1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
  - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
  - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
    - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
    - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
- 2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

### 13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances*: Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
  2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

### 13.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
  - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
  - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

**ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK**

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
  2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
  3. by manufacturers of equipment furnished under the Contract Documents;
  4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
  5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

#### 14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

#### 14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

#### 14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
  - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
  - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

#### 14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

**14.07 Owner May Correct Defective Work**

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

**ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

**15.01 Progress Payments**

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments*
  - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
  - 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
  - a. the Work has progressed to the point indicated;
  - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
  - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
  - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
  - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
  - a. to supervise, direct, or control the Work;
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
  - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
  - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
  - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
  - a. the Work is defective, requiring correction or replacement;
  - b. the Contract Price has been reduced by Change Orders;
  - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
  - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

**D. *Payment Becomes Due***

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

**E. *Reductions in Payment by Owner***

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
  - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

- b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
  - c. Contractor has failed to provide and maintain required bonds or insurance;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
  - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
  - f. The Work is defective, requiring correction or replacement;
  - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - h. The Contract Price has been reduced by Change Orders;
  - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
  - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
  - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
  - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
  3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

#### 15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

#### 15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

#### 15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

#### 15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 15.06 *Final Payment*

##### A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents;
  - b. consent of the surety, if any, to final payment;
  - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

- d. a list of all duly pending Change Proposals and Claims; and
  - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

#### 15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

#### 15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
  - 1. correct the defective repairs to the Site or such adjacent areas;
  - 2. correct such defective Work;
  - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
  - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

## **ARTICLE 16—SUSPENSION OF WORK AND TERMINATION**

### **16.01 *Owner May Suspend Work***

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

### **16.02 *Owner May Terminate for Cause***

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
  - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
  - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
  - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
  - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
  - 1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
  - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

#### 16.03 *Owner May Terminate for Convenience*

- A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
  - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
  - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

#### 16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

## **ARTICLE 17—FINAL RESOLUTION OF DISPUTES**

### **17.01 *Methods and Procedures***

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
  2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
  2. agree with the other party to submit the dispute to another dispute resolution process; or
  3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

## **ARTICLE 18—MISCELLANEOUS**

### **18.01 *Giving Notice***

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
  2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
  3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

### **18.02 *Computation of Times***

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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**SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT**

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# SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

## ARTICLE 1—DEFINITIONS AND TERMINOLOGY

No suggested Supplementary Conditions in this Article.

## ARTICLE 2—PRELIMINARY MATTERS

### 2.02 *Copies of Documents*

SC-2.02 Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor **up to three** printed copies of the Contract Documents (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF).

## ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 No suggested Supplementary Conditions in this Article.

## ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

### 4.05 *Delays in Contractor's Progress*

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

#### 5. *Weather-Related Delays*

- a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.

**ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS**

5.03 *Subsurface and Physical Conditions*

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

- E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
None	None	None

- F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
None	None	None

5.06 *Hazardous Environmental Conditions*

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

- 4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely: **[If there are no such reports, so indicate in the table]**

Report Title	Date of Report	Technical Data
None	None	None

- 5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely: **[If there are no such drawings, so indicate in the table]**

Drawings Title	Date of Drawings	Technical Data
None	None	None

**ARTICLE 6—BONDS AND INSURANCE**

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2010, 2013, or 2018 edition).
2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2010, 2013, or 2018 edition).

6.03 *Contractor’s Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

- D. *Other Additional Insureds:* As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds (in addition to Owner and Engineer) the following: **None**
- E. *Workers’ Compensation and Employer’s Liability:* Contractor shall purchase and maintain workers’ compensation and employer’s liability insurance, including, as applicable, United States Longshoreman and Harbor Workers’ Compensation Act, Jones Act, stop-gap employer’s liability coverage for monopolistic states, and foreign voluntary workers’ compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

<b>Workers’ Compensation and Related Policies</b>	<b>Policy limits of not less than:</b>
<b>Workers’ Compensation</b>	
State	Statutory
Applicable Federal (e.g., Longshoreman’s)	Statutory
Foreign voluntary workers’ compensation (employer’s responsibility coverage), if applicable	Statutory
<b>Employer’s Liability</b>	
Each accident	\$100,000.00
Each employee	\$100,000.00
Policy limit	\$500,000.00

- F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:
  1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor’s employees,
  2. damages insured by reasonably available personal injury liability coverage, and
  3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

- G. *Commercial General Liability—Form and Content:* Contractor’s commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage.
    - a. Such insurance must be maintained for three years after final payment.
    - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
  2. Blanket contractual liability coverage, including but not limited to coverage of Contractor’s contractual indemnity obligations in Paragraph 7.18.
  3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
  4. Underground, explosion, and collapse coverage.
  5. Personal injury coverage.
  6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
  7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 “Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured” or its equivalent.
- H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of “insured contract” (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
  2. Any exclusion for water intrusion or water damage.
  3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
  4. Any exclusion of coverage relating to earth subsidence or movement.
  5. Any exclusion for the insured’s vicarious liability, strict liability, or statutory liability (other than worker’s compensation).
  6. Any limitation or exclusion based on the nature of Contractor’s work.
  7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

<b>Commercial General Liability</b>	<b>Policy limits of not less than:</b>
General Aggregate	\$1,000,000.00
Products—Completed Operations Aggregate	\$1,000,000.00
Personal and Advertising Injury	\$500,000.00
Bodily Injury and Property Damage—Each Occurrence	\$1,000,000.00

- J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

<b>Automobile Liability</b>	<b>Policy limits of not less than:</b>
<b>Combined Single Limit</b>	
Combined Single Limit (Bodily Injury and Property Damage)	\$200,000.00

- K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer’s liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

<b>Excess or Umbrella Liability</b>	<b>Policy limits of not less than:</b>
Each Occurrence	\$1,000,000.00
General Aggregate	\$2,000,000.00

- L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer’s liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy’s policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of **\$1,000,000.00** after accounting for partial attribution of its limits to underlying policies, as allowed above.

- M. *Contractor’s Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor’s operations and completed operations. This insurance must be maintained for no less than three years after final completion.

<b>Contractor’s Pollution Liability</b>	<b>Policy limits of not less than:</b>
Each Occurrence/Claim	\$

<b>Contractor's Pollution Liability</b>	<b>Policy limits of not less than:</b>
General Aggregate	\$

- N. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

<b>Contractor's Professional Liability</b>	<b>Policy limits of not less than:</b>
Each Claim	\$
Annual Aggregate	\$

- O. *Railroad Protective Liability Insurance:* Prior to commencing any Work within 50 feet of railroad-owned and controlled property, Contractor shall (1) endorse its commercial general liability policy with ISO CG 24 17, removing the contractual liability exclusion for work within 50 feet of a railroad, (2) purchase and maintain railroad protective liability insurance meeting the following requirements, (3) furnish a copy of the endorsement to Owner, and (4) submit a copy of the railroad protective policy and other railroad-required documentation to the railroad, and notify Owner of such submittal.

<b>Railroad Protective Liability Insurance</b>	<b>Policy limits of not less than:</b>
Each Claim	N/A
Aggregate	N/A

P.6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Delete Paragraph 6.04.A and insert the following in its place:

- A. Builder's Risk Insurance is not required for this project.

**ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES**

7.03 *Labor; Working Hours*

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be **7:00 AM to 3:30 PM**.

7.10 *Taxes*

SC-7.10 Add a new paragraph immediately after Paragraph 7.10.A:

- B. Owner is exempt from payment of sales and compensating use taxes of the State of **Florida** and of cities and counties thereof on all materials to be incorporated into the Work.
  - 1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.
  - 2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

#### **ARTICLE 8—OTHER WORK AT THE SITE**

No suggested Supplementary Conditions in this Article.

#### **ARTICLE 9—OWNER'S RESPONSIBILITIES**

No suggested Supplementary Conditions in this Article.

#### **ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION**

##### *10.03 Resident Project Representative*

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

- C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:
  - 1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.
  - 2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.
  - 3. *Liaison*
    - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
    - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
    - c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.
  - 4. *Review of Work; Defective Work*

- a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.
  - b. Observe whether any Work in place appears to be defective.
  - c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.
5. *Inspections and Tests*
- a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
  - b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.
6. *Payment Requests: Review Applications for Payment with Contractor.*
7. *Completion*
- a. Participate in Engineer's visits regarding Substantial Completion.
  - b. Assist in the preparation of a punch list of items to be completed or corrected.
  - c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
  - d. Observe whether items on the final punch list have been completed or corrected.
- D. The RPR will not:
- 1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
  - 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
  - 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
  - 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
  - 5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
  - 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
  - 7. Authorize Owner to occupy the Project in whole or in part.

## **ARTICLE 11—CHANGES TO THE CONTRACT**

No suggested Supplementary Conditions in this Article.

## **ARTICLE 12—CLAIMS**

No suggested Supplementary Conditions in this Article.

## **ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK**

No suggested Supplementary Conditions in this Article.

## **ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK**

No suggested Supplementary Conditions in this Article.

## **ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD**

### *15.03 Substantial Completion*

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

## **ARTICLE 16—SUSPENSION OF WORK AND TERMINATION**

No suggested Supplementary Conditions in this Article.

## **ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES**

No suggested Supplementary Conditions in this Article.

## **ARTICLE 18—MISCELLANEOUS**

No suggested Supplementary Conditions in this Article.

C-941

CHANGE ORDER NO.:

Owner: \_\_\_\_\_ Owner's Project No.: \_\_\_\_\_  
 Engineer: \_\_\_\_\_ Engineer's Project No.: \_\_\_\_\_  
 Contractor: \_\_\_\_\_ Contractor's Project No.: \_\_\_\_\_  
 Project: \_\_\_\_\_  
 Contract Name: \_\_\_\_\_  
 Date Issued: \_\_\_\_\_ Effective Date of Change Order: \_\_\_\_\_

The Contract is modified as follows upon execution of this Change Order:

Description:

\_\_\_\_\_

Attachments:

\_\_\_\_\_

Change in Contract Price	Change in Contract Times
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. ____: \$ _____	[Increase] [Decrease] from previously approved Change Orders No.1 to No. ____: Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] this Change Order: \$ _____	[Increase] [Decrease] this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

Recommended by Engineer (if required)

Accepted by Contractor

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

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

Authorized by Owner

Approved by Funding Agency (if applicable)

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

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

**FIELD ORDER NO.:**

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Date Issued:	Effective Date of Field Order:

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

**Reference:**

Specification Section(s):

Drawing(s) / Details (s):

**Description:**

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**Attachments:**

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**Issued by Engineer**

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

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

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

SECTION 01026  
APPLICATIONS FOR PAYMENT  
CONTRACTOR'S PREREQUEST

PART 1 - GENERAL

**1.1 REQUIREMENTS INCLUDED**

Submit Applications for Payment to the Engineer in accord with the schedule established by Conditions of the Contract and Agreement Between Owner and Contractor.

**1.2 RELATED REQUIREMENTS**

- A. Agreement Between Owner and Contractor.
- B. Conditions of the Contract: Progress Payments, Retainages and Final Payment.
- C. Section 01030: Measurement and Payment.
- D. Section 01700: Contract Close-out.
- E. Section 01720: Project Record Documents.

**1.3 FORMAT AND DATA REQUIRED**

- A. Submit three original applications to the Engineer typed on forms provided by the Engineer, Application for Payment, with itemized data typed on 8-1/2 inch x 11 inch white paper continuation sheets.
- B. Fill in required information, including that for Change Orders executed prior to date of submittal of application.
- C. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.
- D. Execute certification with signature of a responsible officer of Contract firm.

**1.4 PREREQUISITES FOR PAYMENTS**

The Contractor shall provide the following as a prerequisite for payment.

- A. Exhibit the updated record drawings as required by Section 01720, Project Record Documents, for review by the Engineer.
- B. Submit required certificates and evidence of passing test for items for which payment is requested in accordance with the testing requirements in Section 01410, Testing Services.
- C. Submit payroll records indicating compliance with Federal Wage Requirements on Form WH347.
- D. Submit revised construction schedules in accordance with Section 01310, Construction Schedules.

**1.5 SUBMITTAL AND PAYMENT PROCEDURE**

A. Contractor's Responsibility

1. In order for progress payments to be made to the Contractor, the Owner must request and receive the funds for each progress payment from the funding agency. The process of requesting and receiving funds requires approximately 45 days. In order to expedite payment to the Contractor, it is recommended that the Contractor notify the Engineer by phone 30 days prior of his intention to submit an Application for Payment and indicate the estimated funds to be requested. This will allow the Engineer to instruct the Owner to proceed with the request for funds. This will help insure the immediate availability of funds upon the final approval of the actual Application for Payment.

2. Contractor shall satisfy all prerequisites prior to submittal of Application for Payment.

3. Contractor shall submit completed and signed Application for Payment to Engineer. Contractor may submit Application for Payment at any time, however, not more frequently than one per month.

B. Engineer's Responsibility

1. Inform Owner/Project Manager of Contractor's advance notice of intention to submit Application for Payment.

2. Review and make recommendation concerning Application for Payment to Owner.

C. Owner's Responsibility

1. Request funds from funding agency.

2. Approve Application for Payment.

3. Make a progress payment to the Contractor not later than five (5) days after Owner receives funds from funding agency on the basis of a duly certified and approved Application for Payment for the work performed during the preceding interim, but to insure the proper performance of this Contract, the Owner shall retain ten percent (10%) of the amount of each estimate until final completion and acceptance of all work covered by this Contract.

PART 2 - PRODUCT

(Not Used)

PART 3 - EXECUTION

(Not Used)

**END OF SECTION**

## **SECTION 01050**

### **FIELD ENGINEERING**

#### **PART 1 - GENERAL**

##### **1.1 REQUIREMENTS INCLUDED**

- A. Provide and pay for field engineering services for work.
1. Survey work required in execution of work.
  2. Civil, structural, or other professional engineering services specified, or required to execute Contractor's construction methods.
  3. The method of field staking for the construction of the work shall be at the option of the Contractor. The Owner shall provide the engineering surveys to establish reference points which in his judgment are necessary to enable the Contractor to proceed with his work.
  4. The accuracy of any method of staking shall be the responsibility of the Contractor. All engineering for vertical and horizontal control shall be the responsibility of the Contractor.
- B. The Contractor shall retain the services of a registered land surveyor licensed in the State of Florida to identify existing control points and maintain a survey during construction. Verify all existing structure locations and all proposed building corner locations, tank locations, equipment locations, and roadway locations.

##### **1.2 QUALIFICATIONS OF SURVEYOR OR ENGINEER**

- A. Qualified engineer or registered land surveyor, acceptable to the Owner and the Engineer.
- B. Registered professional engineer of the discipline required for the specific service on the Project, currently licensed in the State of Florida.

##### **1.3 SURVEY REFERENCE POINTS**

- A. Locate and protect control points prior to starting site work, and preserve all permanent reference points during construction.
1. Make no changes or relocations without prior written notice to the Engineer.
  2. Report to the Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
  3. Require surveyor to replace control points which may be lost or destroyed at no additional cost to the Owner.
    - a. Establish replacements based on original survey control.

##### **1.4 PROJECT SURVEY REQUIREMENTS**

- A. Establish a permanent bench mark onsite, referenced to data established by survey control points.
  - 1. Record location, with horizontal and vertical data, on Record Documents.
- B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:
  - 1. Site improvements.
    - a. Stakes for grading, fill and topsoil replacement.
    - b. Utility slopes and invert elevations.
  - 2. Batter boards for structure.
  - 3. Building foundation, column locations and floor levels.
  - 4. Controlling lines and levels required for mechanical and electrical trades.
- C. From time to time, verify layouts by same methods.
- D. Establish all lines and grades prior to construction of line work for all force mains, water mains and transmission mains at 100 to 200 foot increments.

#### **1.5 RECORDS**

- A. Maintain a complete, accurate log of all control and survey work as it progresses.
- B. At Contract closeout submit a certified site survey at 1"=50' scale on a reproducible tracing sheet 24" x 36", indicating the building corners and location of all structures.
- C. At Contract closeout submit a certified survey at the same scale as the Engineer's line drawings indicating elevations and stationing at 100 foot increments and at all valve and fitting locations.

#### **1.6 SUBMITTALS**

- A. Submit name and address of surveyor and professional engineer to the Engineer.
- B. On request of the Engineer, submit documentation to verify accuracy of field engineering work.
- C. Submit certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.
- D. Submit drawings showing locations of all structures constructed. This drawing shall be included with the Record Documents.

**END OF SECTION**

## SECTION 01100

### EROSION CONTROL AND ENVIRONMENTAL PROTECTION

#### PART 1 - GENERAL

##### 1.1 INTENT

- A. It is the intent of these specifications to provide supplemental information to the contents of the construction drawings on the quality of materials, execution, measurement, etc. These specifications are generic in nature and may contain products and requirements which are not applicable to the project. Likewise, there may be product requirements and techniques that are applicable for controlling erosion and sedimentation during construction that are not addressed herein. Discrepancies between these specifications and the construction drawings, either imagined or real, shall be brought to the attention of the Owner's Engineer for clarification.
- B. Construction activities associated with this project will disturb more than 1 acre of land. The Contractor shall obtain coverage under an NPDES Stormwater Permit and implement appropriate pollution techniques to minimize erosion and sedimentation and properly manage stormwater. The Florida Department of Environmental Protection adopted under Rule 62-621.300(4), F.A.C., the General Permit for Stormwater Discharge from Large and Small Construction Activities (CGP). The CGP requires:
- A CGP Notice of Intent (NOI) (DEP Form 62-621.300(4)(b)) must be submitted to DEP. There is a \$150 application fee for the NOI.
  - A Notice of Termination (NOT) (DEP Form 62-621.300(6)) must be submitted to DEP to discontinue permit coverage. An NOT may be submitted only when the site meets the eligibility requirements for termination specified in the CGP.
- C. The Stormwater Pollution Prevention Plan (SWPPP) must be developed and implemented to be in compliance with the permit. The Plan must include the following:
- 3.5 A site evaluation of how and where pollutants may be mobilized by stormwater
  - 3.6 A site plan for managing stormwater runoff
  - 3.7 Identification of appropriate erosion and sediment controls and Stormwater Best Management Practices (BMPs) to reduce erosion, sedimentation, and stormwater pollution
  - 3.8 A maintenance and inspection schedule
  - 3.9 A record keeping process
  - 3.10 Identification of stormwater exit areas

A copy of the SWPPP must be available at the immediate site of the construction activity. Best Management Practices (BMPs) must be identified to fit the specific project. Both structural and non-structural controls will be applicable. Some of the commonly used controls are:

Structural Controls:

Retention Ponds: Permanent structures designed to allow time for sediments to settle and water to infiltrate the ground.

Temporary Sediment Basins: Structures designed to detain sediment-laden runoff from disturbed areas long enough for sediments to settle out and control the release of stormwater.

Entrance/Exit Controls: Temporary controls, such as gravel, used to stabilize the entrances/exits to the site to reduce the amount of soils transported onto paved roads by vehicles (known as “track-out”).

Silt Fencing: A temporary erosion and sediment control used to prevent dirt from entering waterways before bare soil is stabilized with vegetation.

Berms: A temporary erosion and sediment control that physically prevents polluted runoff from entering nearby storm drain inlets and waters.

Non-Structural Controls:

Stabilization: Techniques such as sodding, seeding/mulching, and stone cover, which reduce the erosion of exposed soils and steep grades.

Phased Construction: Scheduling construction to occur during the dry season or to minimize the amount of land cleared at any one time.

Good Housekeeping: Techniques such as oil and fuel containment, spill prevention and clean-up, and street sweeping of “tracked-out” soils, which help prevent the contamination of stormwater runoff.

- D. Detailed information and guidance for SWPPP development and for compliance Inspections is available at the following web site:

<http://www.dep.state.fl.us/water/stormwater/npdes/construction3.htm>

<http://www.floridadep.org/water/nonpoint/erosion.htm>

## 1.2 DESCRIPTION OF WORK

- A. The work of this section consists of the necessary erosion control and environmental protection measures required to control erosion and provide environmental protection on the project and areas outside the limits of the project, so as to prevent pollution of water, detrimental effects to public or private property adjacent to the project, damage to work on the project, and to satisfy the specific or general conditions of applicable permits and regulations. The need for temporary erosion control and environmental protection shall be considered as an anticipated condition of construction for compliance with state and federal laws and the Contractor's responsibility for providing the necessary solutions as part of these contract documents.
- B. Erosion control work includes, but is not limited to, the following:
- (1) Temporary erosion control
  - (2) Permanent erosion control
- C. Environmental protection work includes, but is not limited to, the following:
- (1) Staked hay bales
  - (2) Sediment control fence
  - (3) Sedimentation basins
  - (4) Turbidity barriers
  - (5) Temporary gravel construction entrance
  - (6) Pollution source controls at construction sites
  - (7) Dewatering discharge control

### 1.3 QUALITY ASSURANCE

- A. Codes and Standards: Perform all work in compliance with applicable requirements of governing authorities having jurisdiction.
- B. Comply with the provisions of the following codes and standards, except as shown or specified:
- C. "Standard Specifications for Road and Bridge Construction", Florida Department of Transportation, latest edition. Herein specified or shown on the plans as "Section 104, FDOT Standard Specifications".
- D. "Roadway and Traffic Design Standards", Florida Department of Transportation, latest edition. Herein specified as "FDOT Standard Index No. 100 through 106".
- E. "American Society for Testing and Materials (ASTM) Publications" as follows:
  - D 123-87 Standard Terminology Relating to Textiles
  - D 1683-81 Failure in Sewn Seams of Woven Fabrics
  - D 2487-83 Test Method for Classification of Soils for Engineering Purposes
  - D 3786-80 Standard Test Method for Mullen Burst Strength
  - D 3787-80 Bursting Strength of Knitted Goods - Constant-Rate-of-Traverse (CRT) Ball Burst
  - D 4439-87 Standard Terminology for Geotextiles
  - D 4533-85 Standard Test Method for Trapezoid Tearing Strength of Geotextiles
  - D 4632-86 Standard Test Method for Breaking Load and Elongation of Geotextiles (Grab Method)
- F. Certification: The contractor shall be responsible for providing the required material certifications prior to construction. Failure to provide certification may result in rejection of the material and replacement at no cost to the Owner.
- G. Testing: An independent testing and inspection service will not be required for the work of this section.

### 1.4 SUBMITTALS

- A. Material Certificates: Provide copies of materials certificates signed by material producer and Contractor, certifying that each material item complies with or exceeds specified requirements. When test requirements are specified, the contractor shall supply results performed by a certified testing laboratory.

## PART 2 – MATERIALS

### 2.1 TEMPORARY EROSION CONTROL (VEGETATION AND COVERINGS)

- A. General: Temporary erosion control features shall consist of, but not be limited to, temporary grassing, temporary sodding, temporary mulching, sandbagging, artificial coverings, berms, and baled hay or straw.
- B. Temporary Grassing: Temporary grassing shall be as specified in Section 1300 except as modified herein. Perennial grass seed may be omitted if permanent erosion control will be placed prior to death of annual grass.

- C. Temporary Sod: Sod shall be as specified in Section 1200.  
Temporary Mulch: Mulch shall be as specified in Section 1300.
- D. Sandbagging: Sandbagging shall consist of furnishing and placing sandbags in configurations, so as to control erosion and siltation.
- E. Artificial Coverings: This work shall consist of furnishing and applying fiber mats, netting, plastic sheeting, or other approved covering to the earth surfaces.
- F. Baled Hay or Straw: This work shall consist of construction of baled hay or straw dams to protect against downstream accumulations of silt. The baled hay or straw dams shall be constructed in accordance with the details shown in the construction drawings or, when details are not shown, in accordance with the FDOT Standard Index No. 102.

## 2.2 TEMPORARY EROSION CONTROL (SILT FENCES AND TURBIDITY BARRIERS)

- A. General: Temporary erosion control features shall consist of, but not be limited to, silt fences, floating turbidity barriers, and staked turbidity barriers. The work shall consist of furnishing, installing, maintaining, and removing temporary fences and barriers in accordance with the manufacturer's recommendations, these specifications, the details shown on the plans, or, when details are not shown, in accordance with the FDOT Standard Index No. 102 & 103. Turbidity barriers in waters of the state may be either floating or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractor's option unless otherwise specified in the plans.
- B. Silt Fence: Silt fence or sediment control fence shall consist of a geotextile fabric attached to posts. The geotextile fabric shall be a woven or non-woven fabric as specified herein. Posts shall be a minimum length of five feet rough or surfaced four-inch by four-inch wood, three-inch minimum diameter wood or steel at least 1.33 pounds per linear foot. When called for, wire reinforcement shall be poultry mesh, a minimum height of 36 inches, 20 gauge wire minimum, with a mesh spacing of one inch. As an alternative, Type A fence conforming to Section 966, FDOT Standard Specifications, may be used.
- C. Staked Turbidity Barrier: In addition to the requirements for a temporary silt fence contained herein, the fabric used for staked turbidity barrier shall have a double stitched hem at the top of the fabric into which has been sewn a braided nylon cord with a minimum diameter of 1/8 inch running the full length of that section of fabric. Supports for staked turbidity barriers shall be a minimum length of three feet seasoned two-inch by four-inch wood, 2-1/2 inch minimum diameter wood, or steel at least 1.33 pounds per linear foot.
- D. Floating Turbidity Barrier: Floating turbidity barrier shall be Type I or Type II in accordance with the details shown in the construction drawings, or, when details are not shown, with the FDOT Standard Index No. 103. The type barrier used will be such as to minimize dispersion of turbid waters from the construction site. Alternate materials may be approved provided that compliance with applicable permit conditions and State water quality standards are maintained.

## 2.3 GEOTEXTILES

- A. Filter Fabric: The geotextile fabric shall be a woven or non-woven fabric consisting of long-chain polymeric filaments or yarns such as polypropylene, polyethylene, polyester, polyamides, or polyvinyl chloride formed into a stable network such that the filaments or

yarns retain their relative position to each other. The base plastic shall contain stabilizers and/or inhibitors to make the filaments resistant to deterioration from ultraviolet light, heat exposure, and commonly encountered chemicals. The edges of the fabric shall be salvaged or otherwise finished to prevent the outer yarn from pulling away from the fabric.

- B. The fabric shall conform to the following physical requirements:

PROPERTIES TEST METHOD ACCEPTABLE VALUES

Seam Strength (min)	ASTM D 1683	120 lbs.
Mullen Burst Strength (min)	ASTM D 3786	200 psi
Puncture Strength (min)	ASTM D 3787	60 lbs.
Trapezoidal Tear Strength (min)	ASTM D 4533	50 lbs.
Grab Tensile Strength (min)	ASTM D 4632	120 lbs.
Elongation (max)	ASTM D 4632	25%
Filtration Efficiency (min)	VTM-51-79	75%
Slurry Flow Rate (min)	VTM-51-79	0.3 gpm/sf

- C. Seams: The seams of the fabric shall be sewn with thread of a material meeting the chemical requirements for the fabric. The minimum seam strength shall comply with the property requirements contained herein.
- D. Shipment and Storage: During shipment and periods of storage, the geotextile shall be protected from direct sunlight, ultra-violet rays, temperatures greater than 140 degrees Fahrenheit, mud, dirt, dust, and debris. Stockpiled materials shall be kept covered at all times.

PART 3 - EXECUTION

3.1 Execution

A. General

1. The installation of temporary erosion control features shall be coordinated with the construction of the permanent erosion control features to the extent necessary to assure effective and continuous control of erosion and water pollution throughout the life of the contract.
2. The Contractor shall take sufficient precautions to prevent pollution of streams, canals, lakes, reservoirs, and other water impoundments, with fuels, oils, bitumens, calcium chloride, or other harmful materials. Also, he shall

conduct and schedule his operations so as to avoid pollution or siltation of such streams, etc.

3. Except as necessary for construction, excavated material shall not be deposited in rivers, streams, canals, or impoundments, or in a position close enough thereto to be washed away by high water or runoff.
4. Where de-watering methods are used, the water shall be treated by one or more of the following methods prior to discharge off-site or into environmental areas: pumping into grassed swales or appropriate vegetated areas, sediment basins, or confined by an appropriate enclosure such as siltation curtains when other methods are not considered appropriate.
5. The Contractor shall not disturb lands or waters outside the limits of construction as staked, except as may be found necessary and authorized by the Owner's Engineer.
6. The locations of and methods of operation in all detention areas, excavation and stockpile areas, and disposal areas shall meet the approval of the Owner's Engineer as being such that erosion during and after completion of the work will not likely result in detrimental conditions, siltations, or water pollution.

B. Limitation of Exposure or Erodible Earth:

1. The Contractor shall limit the surface areas of unprotected erodible earth exposed by clearing and grubbing, excavation, or filling operations and shall provide immediate permanent or temporary erosion or pollution control measures to prevent contamination of any river, stream, lake, tidal water, reservoir, canal, or other impoundment or to prevent detrimental effects on property outside the project and damage to the project. The limitation of area in which excavation and filling operations may be underway shall be commensurate with the contractor's capability and progress in keeping the finish grading, grassing, sodding, and other such permanent erosion control measures current in accordance with the accepted schedule.
2. Under no conditions shall the surface area of erodible earth exposed by clearing and grubbing operations or by excavation and filling operations exceed one-half acre without specific prior approval by the Owner's Engineer. This limitation applies separately to clearing and grubbing operations and excavation and filling operations.
3. The Owner's Engineer may increase or decrease the amount of surface area allowed to be exposed at any one time, on the basis of his analysis of conditions on the project.
4. Permanent erosion control features shall be incorporated into the project at the earliest practical time. Temporary erosion control

features will be used to control erosion prior to the time it is practical to construct permanent control features or to provide immediate temporary control of erosion that develops during normal construction operations but is not associated with permanent erosion control features on the project. In no case shall exposure of

erodible earth be for more than five days without erosion control features being implemented.

5. Temporary erosion control features may be authorized for use in controlling erosion in areas where stage construction or other conditions not under the control of the Contractor preclude completion of a section of work in a continuous manner and in areas where construction operations which must be performed subsequently will cause damage to permanent erosion control features constructed.
6. When the item of Topsoil or Muck Blanket is included in the contract, the rate of construction of these items may be limited by the availability of topsoil or muck from the normal grading operations. The existence of this condition will be considered as precluding completion of a section or roadway in a continuous manner and use of temporary erosion control features will be used in areas so affected.
7. The Contractor shall schedule his operations such that the area of unprotected erodible earth exposed at any one time is not larger than the minimum area necessary for efficient construction operations, and the duration of exposed, uncompleted construction to the elements shall be as short as practicable.
8. Clearing and grubbing shall be so scheduled and performed that grading operations can follow immediately thereafter, and grading operations shall be so scheduled and performed that permanent erosion control features can follow immediate thereafter if conditions on the project permit.

### 3.2 TEMPORARY EROSION CONTROL (VEGETATION AND COVERINGS)

- A. General: Temporary vegetative erosion control features shall be installed in accordance with Section 1300. Temporary coverings shall be installed in accordance with the manufacturer's recommendations.

### 3.3 TEMPORARY EROSION CONTROL (SILT FENCES AND TURBIDITY BARRIERS)

- A. Temporary Silt Fence: Temporary silt fence shall be erected at locations as shown on the plans, as dictated by the SWPPP, or as approved by the Owner's Engineer. The filter fabric shall be reinforced with wire fence, when called for, and the post spacings shall not exceed ten feet. The wire reinforcement shall be installed so that the filter fabric is on the upstream side of the fence, and both the wire fence and the filter fabric are on the upstream side of the posts. Posts shall be uniformly installed with approximately 20 degrees inclination toward the potential silt load (upstream) area. The silt fence shall be maintained in an effective condition at all times while in use.
- B. Filter fabric shall be a minimum of 45 inches wide and shall be secured to the post or fence by suitable staples, tie wire, or hog rings in such a manner as to prevent tearing of the fabric. The bottom of the filter fabric shall be entrenched into the ground a minimum of eight inches to prevent water from flowing under the fence. Filter fabric shall be spliced together only at support posts with a minimum of six-inch overlap and securely sealed.
- C. Staked Turbidity Barrier: Staked turbidity barrier shall be securely fastened to wood or steel supports which are spaced at maximum intervals of six feet and driven a minimum of 12 inches into the ground. A minimum of three supports shall be used. The bottom of

the fabric shall be entrenched into the existing ground a minimum of eight inches. The staked turbidity barrier shall be a minimum of 15 inches in height and shall not exceed 18 inches in height.

- D. The support line sewn in the top hem of the filter fabric shall be used at each post location to secure the fabric to the post at an appropriate height.
- E. Staked turbidity barriers shall be installed across ditch lines and at temporary locations as shown on the plans or approved by the Owner's Engineer where continuous construction activities change the natural contour and drainage runoff.
- F. Posts in staked turbidity barriers shall be installed in the vertical position unless otherwise directed by the Owner's Engineer.
- G. Floating Turbidity Barrier: This work shall consist of the installation and removal of floating turbidity barriers to contain silt and other deleterious materials that may occur as the result of dredging, filling, or other construction activities in waters of the State. The type barrier used will be installed in accordance with the details contained in the plans, or, when details are not shown, in accordance with the FDOT Standard Index No. 103, or as approved by the Owner's Engineer. Alternate methods may be approved provided that compliance with applicable permit conditions and State water quality standards are maintained.
- H. All temporary erosion control features and devices shall be removed and disposed of by the Contractor when permanent erosion control features and devices (grassing, sodding, etc.) have reached the point of final acceptance.

### 3.4 INSPECTION AND MAINTENANCE

- A. General: The Contractor shall, at his expense, provide routine maintenance of permanent and temporary erosion control features until the project is completed and accepted. The Contractor shall inspect all erosion and sediment control facilities within 24 hours of a ¼" rain or greater or once weekly after each rainfall. Any deficiencies shall be immediately corrected by the Contractor.
- B. Silt Fences and Turbidity Barriers: The Contractor shall make a daily review of the location of silt fences and turbidity barriers to ensure that the silt fence or turbidity barriers are properly located for effectiveness and contain no breaches. Where deficiencies exist, additional silt fences or turbidity barriers shall be installed as directed.

Sediment deposits shall be removed when the deposit reaches approximately one-half of the volume capacity of the temporary silt fence or turbidity barrier as directed. Any sediment deposits remaining in place after the temporary silt fence or turbidity barrier is no longer required shall be dressed to conform with the finished grade, prepared and finished as shown on the construction plans, or seeded in accordance with Section 13.

- C. Inspections shall be made by qualified inspectors using Chapter 8 of the Florida Stormwater, Erosion and Sedimentation Control Inspection Manual. Referenced manual can be downloaded from <http://www.floridadep.org/water/nonpoint/erosion.htm>. All inspections shall be formally documented using the forms contained in the appendix to this section of the specifications.

### 3.5 SEWAGE SPILL NOTIFICATION

- A. General: The contractor shall be responsible for any sewage spills that occur on any system being serviced. The contractor shall contact the Owner and the FDEP within 24 hours of any unauthorized discharges from the collection/transmission system. Notification shall be made

in person or by telephone to the Panama City Branch Office, 2353 Jenks Avenue, Panama City FL, 32405, 850-872-4375. Verbal notification shall be followed by written notification within 72 hours of the event. The written report shall contain the following information:

- 3.5.1.1 Location of discharge
- 3.5.1.2 Date and time period of discharge occurrence
- 3.5.1.3 Estimated quantity of sewage discharged
- 3.5.1.4 Whether or not surface waters were affected by the spill
- 3.5.1.5 Actions taken to reduce the impacts of this discharge (e.g. containment, clean-up)
- 3.5.1.6 Cause of discharge
- 3.5.1.7 Actions taken to prevent occurrence
- 3.5.1.8 Any spill more than 1,000 gallons or where public health or the environment may be endangered must be reported to the State Warning Point (800) 320-0519, in addition to FDEP and the Owner.

#### PART 4 - MEASUREMENT AND PAYMENT

##### 4.1 MEASUREMENT AND PAYMENT

- A. General: No separate payment will be made for the work covered by this section except for specific pay items shown in the proposal form, and, therefore, all costs in connection with the work of this section shall be included in the contract price for the item or structure to which it pertains. Additional materials, labor, equipment, tools, and incidentals above and beyond the separate payments contained herein and the work shown on the drawings may be required to satisfy the work of this section.

END OF SECTION

## SECTION 01310

### CONSTRUCTION SCHEDULES

#### PART 1 - GENERAL

##### 1.1 REQUIREMENTS INCLUDED

- A. Promptly after award of the Contract and within ten days after the effective date of the Agreement, prepare and submit to the Engineer estimated construction progress schedules for the work, with subschedules of related activities which are essential to its progress.
- B. Submit revised progress schedules on a monthly basis.
- C. No partial payments shall be approved by the Engineer until there is an approved construction progress schedule on hand.
- D. The Contractor shall designate an authorized representative of his firm who shall be responsible for development and maintenance of the schedule and of progress and payment reports. This representative of the Contractor shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the commitments of the Contractor's schedule.

##### 1.2 RELATED REQUIREMENTS

- A. Conditions of the Contract.
- B. Section 01010: Summary of Work.

##### 1.3 FORM OF SCHEDULES

- A. Prepare schedules in the form of a horizontal bar chart.
  - 1. Provide separate horizontal bar for each trade or operation within each structure or item.
  - 2. Horizontal time scale: In weeks from start of construction and identify the first work day of each month.
  - 3. Scale and spacing: To allow space for notations and future revisions.
  - 4. Minimum sheet size: 8-1/2 inches x 14 inches.
- B. Format of listings: The chronological order of the start of each item of work for each structure.
- C. Identification of listings: By major specification section numbers as applicable and structure.

## **1.4 CONTENT OF SCHEDULES**

### **A. Construction Progress Schedule:**

1. Show the complete sequence of construction by activity.
2. Show the dates for the beginning of, and completion of, each major element of construction in no more than a two-week increment scale. Specifically list, but do not limit to:
  - a. Site clearing.
  - b. Site utilities.
  - c. Foundation work.
  - d. Structural framing.
  - e. Subcontractor work.
  - f. Equipment installations.
  - g. Finishings.
  - h. Instrumentation.
  - i. Painting.
  - j. Schooling.
  - k. Testing.
  - l. Start-up.
  - m. Receipt of spare parts.
  - n. Pipe installation.
  - o. Boring and jacking.
  - p. Restoration.
3. Show projected percentage of completion for each item, as of the first day of each month.
4. Show projected dollar cash flow requirements for each month of construction.

### **B. Submittals Schedule for Shop Drawings, and Samples in accordance with Section 01340. Show:**

1. The dates for Contractor's submittals.
2. The dates submittals will be required for owner-furnished products, if applicable.
3. The dates approved submittals will be required from the Engineer.

### **C. A typewritten list of all long-lead items (equipment, materials, etc.).**

## **1.5 PROGRESS REVISIONS**

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule:
  1. Major changes in scope.
  2. Activities modified since previous submission.
  3. Revised projections of progress and completion.
  4. Other identifiable changes.

- C. Provide a narrative report as needed to define:
  - 1. Problem areas, anticipated delays, and the impact on the schedule.
  - 2. Corrective action recommended, and its effect.
  - 3. The effect of changes on schedules of other prime Contractors.

**1.6 SUBMISSIONS**

- A. Submit initial schedules to the Engineer within 10 days after the effective date of the Agreement.
  - 1. The Engineer will review schedules and return review copy within 21 days after receipt.
  - 2. If required, resubmit within 7 days after return of review copy.
- B. Submit revised monthly progress schedules with that month's application for payment.
- C. Submit one copy.

**1.7 DISTRIBUTION**

- A. Distribute copies of the revised schedules to:
  - 1. Engineer.
  - 2. Job site file.
  - 3. Subcontractors.
  - 4. Other concerned parties.
  - 5. Owner (two copies).
- B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

**PART 2 - PRODUCTS**

(Not Used)

**PART 3 - EXECUTION**

(Not Used)

**END OF SECTION**

## SECTION 01340

### SHOP DRAWINGS, WORKING DRAWINGS, AND SAMPLES

#### PART 1 - GENERAL

##### 1.1 REQUIREMENTS INCLUDED

- A. The Contractor shall submit to the Engineer for review and exception, if any, such working drawings, shop drawings, test reports and data on materials and equipment (hereinafter in this article called data), and material samples (hereinafter in this article called samples) as are required for the proper control of work, including but not limited to those working drawings, shop drawings, data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.
- B. Within thirty (30) calendar days after the effective date of the Agreement, the Contractor shall submit to the Engineer a complete list of preliminary data on items for which shop drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the Engineer shall in no way expressed or implied relieve the Contractor from submitting complete shop drawings and providing materials, equipment, etc., fully in accordance with the Specifications. This procedure is required in order to expedite final review of shop drawings.
- C. The Contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the Owner and the Engineer. This log should include the following items:
  1. Submittal-Description and Number assigned.
  2. Date to Engineer.
  3. Date returned to Contractor (from Engineer).
  4. Status of Submittal (Approved/Resubmit/Rejected).
  5. Date of Resubmittal and Return (as applicable).
  6. Date material released (for fabrication).
  7. Projected date of fabrication.
  8. Projected date of delivery to site.
  9. Status of O&M submittal.
- D. Shop drawings to be submitted shall include but not necessarily be limited to:
  1. Concrete design mix(es);
  2. Each item of equipment and/or material listed in the equipment and material schedule;
  3. Each item of process instrumentation and control system including system schematic diagrams;
  4. Prestressed and precast concrete members;
  5. Reinforcing steel;
  6. Structural steel fabrications;
  7. Miscellaneous metals fabrications and castings;
  8. Paintings and coatings system;
  9. Electrical fixtures hardware and panels;
  10. Piping and duct work, layout and dimension drawings.

## 1.2 RELATED REQUIREMENTS

- A. Section 00700: Standard General Conditions of the Construction Contract.
- B. Section 01310: Construction Schedules.
- C. Section 01720: Project Record Documents.
- D. Section 01730: Operating and Maintenance Data.
- E. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that the reviewed shop drawings, working drawings and samples will be needed.

## 1.3 CONTRACTOR'S RESPONSIBILITY

- A. It is the duty of the Contractor to check all drawings, data and samples prepared by or for him before submitting them to the Engineer for review. Each and every copy of the drawings and data shall bear Contractor's stamp showing that they have been so checked. Shop drawings submitted to the Engineer without the Contractor's stamp will be returned to the Contractor for conformance with this requirement. Shop drawings shall indicate any deviations in the submittal from requirements of the Contract Documents.
- B. Determine and verify:
  - 1. Field measurements.
  - 2. Field construction criteria.
  - 3. Catalog numbers and similar data.
  - 4. Conformance with Specifications.
- C. The Contractor shall furnish the Engineer a schedule of shop drawing submittals fixing the respective dates for the submission of shop and working drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.
- D. The Contractor shall not begin any of the work covered by a drawing, data, or a sample returned for correction until a revision or correction thereof has been reviewed and returned to him, by the Engineer, approved.
- E. The Contractor shall submit to the Engineer all drawings and schedules sufficiently in advance of construction requirements to provide no less than twenty-one (21) calendar days for checking and appropriate action from the time the Engineer receives them.
- F. The Contractor shall submit two (2) copies of descriptive or product data submittals to complement shop drawings for the Engineer plus the number of copies which the Contractor requires. The Engineer will retain two (2) sets.

- G. The Contractor shall clearly delineate each variation from the Contract Specifications and Drawings within a shop drawing submittal and request a deviation from the Contract Documents. Contractor shall clearly state why such a variation is requested. Request for variance and its documentation shall be noted in and attached to the Contractor's Letter of Transmittal of the shop drawing to be considered.
- H. The Contractor shall be responsible for and bear all cost of damages which may result from the ordering of any material or from proceeding with any part of work prior to the review by the Engineer or the necessary shop drawings.

#### **1.4 ENGINEER'S REVIEW OF SHOP DRAWINGS**

- A. The Engineer's review of drawings, data and samples submitted by the Contractor will cover only general conformity to the Specifications, external connections, and dimensions which affect the installation. The Engineer's review and exception, if any, will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown.
- B. The review of drawings and schedules will be general, and shall not be construed:
  - 1. as permitting any departure from the Contract requirements;
  - 2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
  - 3. as approving departures from details furnished by the Engineer, except as otherwise provided herein.
- C. If the drawings or schedules as submitted describe variations per subparagraph 1.5.D., and show a departure from the Contract requirements which the Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Engineer may return the reviewed drawings without noting an exception.
- D. When reviewed by the Engineer, each of the shop drawings will be identified as having received such review being so stamped and dated. Shop drawings stamped "REJECTED" and with required corrections shown will be returned to the Contractor for correction and resubmittal.
- E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing or on resubmitted shop drawings, to revisions other than the corrections requested by the Engineer on previous submissions. The Contractor shall make any corrections required by the Engineer.
- F. If the Contractor considers any correction indicated on the drawings to constitute a change to the Contract Drawings or Specifications, the Contractor shall give written notice thereof to the Engineer.

- G. The Engineer will review a submittal/resubmittal a maximum of three (3) times after which cost of review will be borne by the Contractor. The cost of engineering shall be equal to the Engineer's charges to the Owner under the terms of the Engineer's agreement with the Owner.
- H. When the shop drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.
- I. No partial submittals will be reviewed. Submittals not complete will be returned to the Contractor and will be considered "REJECTED" until resubmitted.

## 1.5 SHOP DRAWINGS

- A. When used in the Contract Documents, the term "shop drawings" shall be considered to mean Contractor's plans for material and equipment which become an integral part of the Project. These drawings shall be complete and detailed. Shop drawings shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawings, and wiring and control diagrams. Cuts, catalogs, pamphlets, descriptive literature, and performance and test data, shall be considered only as supportive to required shop drawings as defined above.
- B. Drawings and schedules shall be checked and coordinated with the work of all trades involved, before they are submitted for review by the Engineer and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.
- C. Each shop drawing shall have a blank area 3-1/2 inches by 3-1/2 inches, located adjacent to the title block. The title block shall display the following:
  - 1. Number and title of the drawing.
  - 2. Date of drawing or revision.
  - 3. Name of project building or facility.
  - 4. Name of contractor and subcontractor submitting drawing.
  - 5. Clear identification of contents and location of the work.
  - 6. Specification title and number.
- D. If drawings show variations from Contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in his letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations, he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed.
- E. Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog references, size, finish and all other

pertinent data.

- F. All data submitted to the Engineer for approval shall be completely legible and shall clearly delineate items for which approval is sought; strike out or otherwise obliterate those items which are not applicable to this specific project.
- G. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name, and address and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained. In addition, a maintenance and lubrication schedule for each piece of equipment shall be submitted along with each shop drawing submittal. This schedule shall be in the tablet form.
- H. All manufacturers or equipment suppliers who propose to furnish equipment or products under Divisions 11, 12, 13, 14, 15 and 16 shall submit an installation list to the Engineer along with the required shop drawings. The installation list shall include at least five installations where identical equipment has been installed and has been in operation for a period of at least one (1) year.
- I. Only the Engineer will utilize the color "red" in marking shop drawing submittals.
- J. Before final payment is made, the Contractor shall furnish to Engineer two (2) sets of record shop drawings all clearly revised, complete and up to date showing the permanent construction as actually made for all reinforcing and structural steel, miscellaneous metals, process and mechanical equipment, yard piping, electrical system and instrumentation system.

## **1.6 WORKING DRAWINGS**

- A. When used in the Contract Documents, the term "working drawings" shall be considered to mean the Contractor's plans for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities, ground water control systems, forming and falsework; for underpinning; and for such other work as may be required for construction but does not become an integral part of the Project.
- B. Copies of working drawings as noted in subparagraph 1.6.A. above, shall be submitted to the Engineer where required by the Contract Documents or requested by the Engineer, and shall be submitted at least thirty (30) calendar days (unless otherwise specified by the Engineer) in advance of their being required for work.
- C. Working drawings shall be signed by a registered Professional Engineer, currently licensed to practice in the State of Florida and shall convey, or be accompanied by, calculation or other sufficient information to completely explain the structure, machine, or system described and its intended manner of use. Prior to commencing such work, working drawings must have been reviewed without specific exceptions by the Engineer, which review will be for general conformance and will not relieve the Contractor in any way from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error are assumed by the Contractor; the Owner and Engineer shall have no responsibility therefore.

## **1.7 SAMPLES**

- A. The Contractor shall furnish, for the approval of the Engineer, samples required by the Contract Documents or requested by the Engineer. Samples shall be delivered to the Engineer as specified or directed. The Contractor shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until approved by the Engineer.
- B. Samples shall be of sufficient size and quantity to clearly illustrate:
1. Functional characteristics of the product, with integrally related parts and attachment devices.
  2. Full range of color, texture and pattern.
  3. A minimum of two samples of each item shall be submitted.
- C. Each sample shall have a label indicating:
1. Name of Project.
  2. Name of Contractor and Subcontractor.
  3. Material or Equipment Represented.
  4. Place of Origin.
  5. Name of Producer and Brand (if any).
  6. Location of Project.
- (Samples of finished materials shall have additional markings that will identify them under the finished schedules.)
- D. The Contractor shall prepare a transmittal letter in triplicate for each shipment of samples containing the information required in subparagraph 1.7.B. above. He shall enclose a copy of this letter with the shipment and send a copy of this letter to the Engineer. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.
- E. Approved samples not destroyed in testing shall be sent to the Engineer or stored at the site of the work. Approved samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the approved samples. Samples which failed testing or were not approved will be returned to the Contractor at his expense, if so requested at time of submission.

## **PART 2 - PRODUCTS**

(Not Used)

## **PART 3 - EXECUTION**

(Not Used)

**END OF SECTION**

## SECTION 01410

### TESTING AND TESTING LABORATORY SERVICES

#### PART 1 - GENERAL

##### 1.1 REQUIREMENTS INCLUDED

- A. The Contractor shall arrange for, schedule, provide and pay for the test called for in the specifications.
- B. The test shall be performed by an independent certified testing laboratory approved by the Engineer.
- C. The Contractor shall submit the name and evidence of certification of the testing laboratory prior to start of construction.
- D. The type, number and frequency of tests set forth in the appropriate Sections herein represent the minimum number of passing tests. Tests which indicate non-compliance (i.e., failing test) do not count towards the minimum number required. The Contractor may test the work in excess of the minimums and as necessary to assure himself the work complies with the specifications. The minimum type, number and frequency of tests shall be conducted.
- E. When test results indicate non-compliance with the specifications, the Contractor shall take additional tests to determine if deficiencies have been corrected. The type, number and scheduling of tests so ordered shall be determined by the Engineer. The Contractor shall provide and pay for these additional tests.
- F. The Engineer shall be furnished results of all tests conducted. Test results shall be mailed directly from the testing laboratory to the Engineer. The test shall be signed and sealed by a Registered Professional Engineer registered in the State of Florida. Such tests results shall be submitted to the Engineer prior to the Engineer's approval of Contractor's pay request that request payment for such items that require testing.
- G. Prior to final completion, the Contractor shall submit to the Engineer a statement indicating that all work performed as a part of this Contract is in accordance with the plans and specifications or noting any deviation thereof.

##### 1.2 RELATED REQUIREMENTS

- A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.
- B. Respective sections of specifications: Certification of products.
- C. Each specification section listed: Laboratory tests required, and standards for testing.

D. Testing Laboratory inspection, sampling and testing is required for but not limited to the following:

1. Section 02100: Site Preparation
2. Section 02200: Earthwork
3. Section 02520: Asphaltic Concrete Paving
4. Section 03200: Concrete Reinforcement
5. Section 03300: Concrete
6. Section 04050: Masonry

### **1.3 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY**

A. Laboratory is not authorized to:

1. Release, revoke, alter or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the Work.
3. Perform any duties of the Contractor.

### **1.4 CONTRACTOR'S RESPONSIBILITIES**

A. Cooperate with Laboratory personnel, provide access to Work, to Manufacturer's operations.

B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.

C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes which require control by the testing laboratory.

D. Materials and equipment used in the performance of work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents. The Engineer may require the Contractor to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents.

E. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, with the cost having been included in the item for which the testing is associated, and no extra charge to the Owner shall be allowed on account of such testing and certification.

F. Furnish incidental labor and facilities:

1. To provide access to Work to be tested.
2. To obtain and handle samples at the Project site or at the source of the product to be tested.
3. To facilitate inspections and tests.
4. For storage and curing of test samples.

G. Notify Laboratory and Engineer sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

## **PART 2 - PRODUCTS**

(Not Used)

**PART 3 - EXECUTION**

(Not Used)

**END OF SECTION**

## SECTION 01580

### PROJECT IDENTIFICATION SIGN

#### PART 1 - GENERAL

##### 1.1 REQUIREMENTS

- A. Contractor shall furnish, install and maintain a 4' x 8' project identification sign.
- B. The sign shall remain in place and become the property of the owner upon completion of construction.
- C. The sign shall be complete and properly installed no later than 20 days beyond the date of notice to proceed.
- D. The engineer shall furnish contractor with lettering information for the sign.

##### 1.2 QUALITY ASSURANCE

- A. Sign Painter: Professional Experience in type of work required.
- B. Finishes, Painting: Adequate to resist weathering and fading for a two (2) year period.

#### PART 2 - PRODUCTS

##### 2.1 SIGN MATERIALS

- A. Structure and Framing: Shall be new pressure treated wood, in sound condition structurally adequate to work and suitable for specified finish. The sign shall be supported by 4" x 4" posts with a 2" x 4" frame.
- B. Sign Surfaces: Exterior 3/4 inch type A-C softwood plywood.
- C. Rough Hardware and Nails: Galvanized.
- D. Paint: Exterior quality enamel paint.

## **PART 3 - EXECUTION**

### **3.1 PROJECT IDENTIFICATION SIGN**

- A. Contractor shall construct project sign as shown on the drawings or as described herein.
- B. Paint exposed surfaces of supports, framing and surface material; one coat of primer and one coat of white exterior paint.
- C. Paint graphics in blue exterior paint in block style in the sizes shown on the drawings or as furnished by the Engineer.
- D. Erect signs in the numbers and locations stated below, in areas at high public visibility, as approved by the Engineer and Owner.

### **3.2 MAINTENANCE**

Maintain signs and supports in a neat, clean condition; repair damages to structure, framing or sign.

### **3.3 REMOVAL**

Contractor shall not remove signs. Sign shall become property of the owner.

**END OF SECTION**

**SECTION 01700**  
**CONTRACT CLOSE-OUT**

**PART 1 - GENERAL**

**1.1 REQUIREMENTS INCLUDED**

Comply with requirements stated in Conditions of the Contract and in Specifications for administrative procedures in closing out the Work.

**1.2 RELATED REQUIREMENTS**

- A. Conditions of the Contract. Fiscal provisions, legal submittals and additional administrative requirements.
- B. Section 01720: Project Record Documents.
- C. Section 01730: Operating and Maintenance Data.
- D. Section 01740 and/or Section 01742: Warranties and Bonds.
- E. The respective sections of Specification: Close-out Submittals Required of Trades.

**1.3 SUBSTANTIAL COMPLETION**

- A. When Contractor considers the Work is substantially complete, he shall submit to the Engineer:
  - 1. A written notice that the Work, or designated portion thereof, is ready for a substantial completion inspection.
  - 2. A list of items to be completed or corrected.
- B. Within a reasonable time after receipt of such notice, the Engineer will make an inspection to determine the status of completion.
- C. Should the Engineer determine that the Work is not substantially complete:
  - 1. The Engineer will promptly notify the Contractor, in writing, giving the reasons therefor.
  - 2. Contractor shall remedy the deficiencies in the Work, and send a second written notice of substantial completion to the Engineer.
  - 3. The Engineer will reinspect the Work.

- D. When the Engineer finds that the Work is substantially complete, he will:
1. Prepare and deliver to Owner a tentative Certificate of Substantial Completion found in Section 00640, with a tentative list "punch list" of items to be completed or corrected before final payment.
  2. After consideration of any objections made by the Owner as provided in Conditions of the Contract, and when the Engineer considers the Work substantially complete, he will execute and deliver to the Owner and the Contractor a definite Certificate of Substantial Completion with a revised punch list of items to be completed or corrected.

#### **1.4 FINAL INSPECTION**

- A. When Contractor considers the Work is complete, he shall submit written certification that:
1. Contract Documents have been reviewed.
  2. Work has been inspected for compliance with Contract Documents.
  3. Work has been completed in accordance with Contract Documents.
  4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
  5. Work is completed and ready for final inspection.
- B. The Engineer will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
- C. Should the Engineer consider that the Work is incomplete or defective:
1. The Engineer will promptly notify the Contractor, in writing, listing the incomplete or defective Work.
  2. Contractor shall take immediate steps to remedy the stated deficiencies and send a second written certification to the Engineer that the Work is complete.
  3. The Engineer will reinspect the Work.
- D. When the Engineer finds that the Work is acceptable under the Contract Documents, he shall request the Contractor to make close-out submittals.

#### **1.5 REINSPECTION FEES**

- A. Should the Engineer perform re-inspections due to failure of the Work to comply with the claims of status of completion made by the Contractor:
1. Owner will compensate the Engineer for such additional services.
  2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

#### **1.6 CONTRACTOR'S CLOSE-OUT SUBMITTALS TO ENGINEER**

- A. Evidence of compliance with requirements of governing authorities.
- B. Project Record Documents: To requirements of Section 01720.

- C. Operating and Maintenance Data, Instructions to Owner's Personnel: To requirements of Section 01730.
- D. Warranties and Bonds: To requirements of Section 01740 and Section 01742.
- E. Keys and Keying Schedule.
- F. Spare Parts and Maintenance Materials: To requirements of Section 01730.
- G. Evidence of Payment and Release of Liens: To requirements of General and Supplementary Conditions.
- H. Certificate of Insurance for Products and Completed Operations.

**1.7 FINAL ADJUSTMENT OF ACCOUNTS**

- A. Submit a final statement of accounting to the Engineer.
- B. Statement shall reflect all adjustments to the Contract Sum:
  - 1. The original Contract Sum.
  - 2. Additions and deductions resulting from:
    - a. Previous Change Orders.
    - b. Allowances.
    - c. Unit Prices.
    - d. Deductions for uncorrected Work.
    - e. Penalties and Bonuses.
    - f. Deductions for liquidated damages.
    - g. Deductions for reinspection payments.
    - h. Other adjustments.
  - 3. Total Contract Sum, as adjusted.
  - 4. Previous payments.
  - 5. Sum remaining due.
- C. Engineer will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

**1.8 FINAL APPLICATION FOR PAYMENT**

Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

**PART 2 - PRODUCTS**

(Not Used)

**PART 3 - EXECUTION**

(Not Used)

**END OF SECTION**

**SECTION 01720  
PROJECT RECORD DOCUMENTS**

**PART 1 - GENERAL**

**1.1 REQUIREMENTS INCLUDED**

- A. Maintain at the site for the Owner one record copy of:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. Change Orders and other Modifications to the Contract.
  - 5. Engineer's Field Orders or written instructions.
  - 6. Approved Shop Drawings, Working Drawings and Samples.
  - 7. Field Test records.
  - 8. Construction photographs.

**1.2 RELATED REQUIREMENTS**

- A. Section 01340: Shop Drawings, Working Drawings and Samples.

**1.3 MAINTENANCE OF DOCUMENTS AND SAMPLES**

- A. Store documents and samples in Contractor's field office apart from documents used for construction.
  - 1. Provide files and racks for storage of documents.
  - 2. Provide locked cabinet or secure storage space for storage of samples.
- B. File documents and samples in accordance with CSI/CSC format.
- C. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- D. Make documents and samples available at all times for inspection by the Engineer.
- E. As a prerequisite for monthly progress payments, the Contractor is to exhibit the currently updated "record documents" for review by the Engineer and the Owner.

**1.4 MARKING DEVICES**

- A. Provide felt tip marking pens for recording information in the color code designated by the Engineer.

## 1.5 RECORDING

- A. Label each document "PROJECT RECORD" in neat large, printed letters.
- B. Record information concurrently with construction progress.
  - 1. Do not conceal any work until required information is recorded.
- C. Record Drawings ("As-Builts"):
  - 1. Depths of various elements of foundation in relation to finish first floor datum.
  - 2. All underground piping with elevations and dimensions. Changes in piping location. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Actual installed pipe material, class, etc.
  - 3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
  - 4. Field changes of dimension and detail.
  - 5. Changes made by Field Order or by Change Order.
  - 6. Details not on original Contract drawings.
  - 7. Equipment and piping relocations.
  - 8. Major architectural and structural changes including relocation of doors, windows, etc.

A complete set of record drawings must be of professional quality, legibly marked in red ink to record the actual construction configuration, with coversheet labeled "CERTIFIED AS-BUILT", signed and dated by the Contractor, submitted to the Engineer in "Hard Copy", and if so specified in the Bid Proposal "As-Built Drawings" line item, shall also be submitted to the Engineer in AutoCAD format on compact disc. Final payment will be withheld until receipt of record documents.
- D. Specifications and Addenda; legibly mark each Section to record:
  - 1. Manufacturer, trade name, catalog number, and Supplier of each Product and item of equipment actually installed.
  - 2. Changes made by Field Order or by Change Order.
- E. Shop Drawings (after final review and approval):
  - 1. One set of record shop drawings for each process equipment, piping, (including casings) electrical system and instrumentation system.

**1.6 SUBMITTAL**

- A. At Contract close-out, deliver Record Documents to the Engineer for the Owner.
- B. Accompany submittal with transmittal letter, containing:
  - 1. Date.
  - 2. Project title and number.
  - 3. Contractor's name and address.
  - 4. Title and number of each Record Document.
  - 5. Signature of Contractor or his authorized representative.

**PART 2 - PRODUCTS**

(Not Used)

**PART 3 - EXECUTION**

(Not Used)

**END OF SECTION**

## SECTION 01730

### OPERATION AND MAINTENANCE MANUALS

#### Part 1 - General

#### 1.1 SCOPE OF WORK

The work under this section includes the furnishings bound manuals of instruction on the operation and maintenance of the equipment, treatment plant, pump stations, and all appurtenances installed under these specifications.

#### 1.2 OPERATING AND MAINTENANCE DATA

##### A. REQUIREMENTS INCLUDED:

1. Compile product data and related information appropriate for Owner's maintenance and operation of products furnished under Contract and furnish an operation and maintenance manual in accordance with this section.
2. Preparation of data shall be done by personnel:
  - a. Trained and experienced in maintenance and operation of described products.
  - b. Familiar with requirements of this Section.
  - c. Skilled as technical writer to the extent required to communicate essential data to personnel unfamiliar with the equipment being discussed.
  - d. Skilled as draftsman competent to prepare required drawings.
3. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.

##### B. RELATED REQUIREMENTS:

1. Section 01340: Shop Drawings, Working Drawings & Samples
2. Section 01700: Contract Closeout
3. Section 01720: Project Record Documents
4. Section 01740: Warranties & Bonds

C. FORM OF SUBMITTALS:

1. Prepare data in form of an instructional manual for use by Owner's personnel.
2. Format:
  - a. Size: 8-1/2 inches x 11 inches.
  - b. Paper: 20 pound minimum white, for typed pages.
  - c. Text: Manufacturer's printed data, or neatly typewritten.
3. Drawings:
  - a. Provide reinforced punched binder tab, bind in with text.
  - b. Reduce larger drawings and fold to size of text pages but not larger than 14 inches x 17 inches.
4. Provide fly-leaf for each separate product, or each piece of operating equipment.
  - a. Provide typed description of product, and major component parts of equipment.
  - b. Provide indexed tabs.
5. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:
  - a. Title of Project.
  - b. Identity of separate structure as applicable.
  - c. Identity of general subject matter covered in the manual.
6. Binders:
  - a. Commercial quality three-post binders with durable and cleanable plastic covers.
  - b. Maximum post width: 2 inches.
  - c. When multiple binders are used, correlate the data into related consistent groupings.

## D. CONTENT OF MANUAL

1. Neatly typewritten table of contents for each volume, arranged in systematic order.

a. Contractor, name of responsible principal, address and telephone number.

b. A list of each product required to be included, indexed to content of the volume.

c. Identify each product by product name and other identifying symbols as set forth in Contract Documents.

d. List, with each product, name, address and telephone number of:

1. Subcontractor or installer.
2. Maintenance contractor, as appropriate.
3. Identify area of responsibility of each.
4. Local source of supply for parts and replacement.

2. Product Data

a. Include only those sheets which are pertinent to the specific product.

b. Annotate each sheet to:

1. Clearly identify specific product or part installed.
2. Clearly identify data applicable to installation.
3. Delete references to inapplicable information.

3. Drawings

a. Supplement product data with drawings as necessary to clearly illustrate relations of component parts of equipment and systems, and control and flow diagrams.

b. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.

c. Do not use Project Record Documents as maintenance drawings.

4. Written test, as required to supplement product data for the particular installation:

a. Organize in consistent format under separate headings for different procedures.

b. Provide logical sequence of instructions of each procedure.

5. Copy of each warranty, bond and service contract issued.

a. Provide information sheet for Owner's personnel, give:

1. Proper procedures in event of failure.
2. Instances which might affect validity of warranties or bonds.

E. SUBMITTAL SCHEDULE:

1. Submit two copies of preliminary draft of proposed formats and outlines of contents of Operation and Maintenance Manuals within 30 days after Notice to Proceed.

a. The Engineer will review the preliminary draft and return one copy with comments.

2. Submit two copies of completed data in final form no later than 30 days following the Engineer's review of the last shop drawing and/or other submittal specified under Section 01340.

a. One copy will be returned with comments to be incorporated into final copies.

3. Submit five (5) copies of complete manual in final form directly to the office of the Engineer within 30 calendar days of product shipment to the project site and preferably within 30 days after the reviewed copy is received.

4. Submit five (5) copies of addendum to the operation and maintenance manuals as applicable and certifications within 30 days after final inspection and plant start-up test.

F. INSTRUCTION OF OWNER'S PERSONNEL:

1. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in operation, adjustment and maintenance of products, equipment and systems.

2. Operating and maintenance manual shall constitute the basis of instruction.

a. Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance.

## **1.5 BASIS OF PAYMENT**

No separate payment will be made for work accomplished under this section of the Specifications. Compensation for these items shall be included in the appropriate pay item with which they are associated.

### **PART 2 - PRODUCTS**

(NOT USED)

### **PART 3 - EXECUTION**

(NOT USED)

**END OF SECTION**

## **SECTION 01740**

### **WARRANTIES AND BONDS**

#### **PART 1 - GENERAL**

##### **1.1 REQUIREMENTS INCLUDED**

- A. Compile specified warranties and bonds, as in the General Conditions.
- B. Co-execute submittals when so specified.
- C. Review submittals to verify compliance with Contract Documents.
- D. Submit to the Engineer for review and transmittal to Owner.

##### **1.2 RELATED REQUIREMENTS**

- A. Instructions to Bidders: Bid or Proposal Bonds.
- B. Conditions of the Contract: Performance Bond and Payment Bond.
- C. Section 00700: General Conditions.
- D. Section 01700: Contract Close-out.

##### **1.3 SUBMITTAL REQUIREMENTS**

- A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.
- B. Number of original signed copies required: Two each.
- C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.
  - 1. Product or work item.
  - 2. Firm, with name of principal, address and telephone number.
  - 3. Scope.
  - 4. Date of beginning of warranty, bond or service and maintenance contract.
  - 5. Duration of warranty, bond or service maintenance contract.

6. Provide information for Owner's personnel:
  - a. Proper procedure in case of failure.
  - b. Instances which might affect the validity of warranty or bond.
7. Contractor, name of responsible principal, address and telephone number.

#### **1.4 FORM OF SUBMITTALS**

- A. Prepare in duplicate packets.
- B. Format:
  1. Size 8-1/2 inches x 11 inches, punch sheets for standard 3-post binder.
    - a. Fold larger sheets to fit into binders.
  2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
    - a. Title of Project.
    - b. Name of Contractor.
- C. Binders: Commercial quality, three-post binder, with durable and cleanable plastic covers and maximum post width of 2 inches.

#### **1.5 WARRANTY SUBMITTAL REQUIREMENTS**

- A. For all major pieces of equipment, submit a warranty from the equipment manufacturer. The manufacturer's warranty period shall be concurrent with the Contractor's for one (1) year or longer (see section D below), commencing at the time of acceptance by the Owner (see Section 01700).
- B. The Contractor shall be responsible for obtaining certificates for equipment warranty for all major equipment specified under Division 11, 13, 14, 15 and 16 and which lists for more than \$1,000. The Engineer reserves the right to request warranties for equipment not classified as major. The Contractor shall still warrant equipment not considered to be "major" in the Contractor's one-year warranty period even though certificates of warranty may not be required.
- C. In the event that the equipment manufacturer or supplier is unwilling to provide a one-year warranty commencing at the time of Owner acceptance, the Contractor shall obtain from the manufacturer a two (2) year warranty commencing at the time of equipment delivery to the job site. This two-year warranty from the manufacturer shall not relieve the Contractor of the one-year warranty starting at the time of the Owner acceptance of the equipment.

**PART 2 - PRODUCTS**

(Not Used)

**PART 3 - EXECUTION**

(Not Used)

**END OF SECTION**

**SECTION 02100**

**SITE PREPARATION**

**PART 1 - GENERAL**

**1.01 SCOPE OF WORK**

- A. This Section covers clearing, grubbing, and stripping within the construction sites, complete as specified herein.
- B. The Contractor shall clear and grub all of the area within the limits of construction as required to complete the Work.
- C. The Contractor's attention is directed to any soil erosion and sediment control ordinances in force. The Contract shall comply with all applicable sections of these ordinances.

**1.02 MEASUREMENT AND PAYMENT**

- A. No separate pay item is provided for Site Preparation, thus the cost will be included in the Total Bid price for this contract.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.01 CLEARING**

- A. The surface of the ground, for the area to be cleared and grubbed shall be completely cleared of all timber, brush, stumps, roots, grass, weeds, rubbish, and all other objectionable obstructions resting on or protruding through the surface of the ground. Where construction necessitates the removal of trees, the Contractor shall obtain all required permits. Removal of trees shall be only as directed by the Engineer. Clearing operations shall be conducted so as to prevent damage to existing structures and installations, and to those under construction, and so as to provide for the safety of employees and others.
- B. As determined by the Engineer, where excavation, tree removal, stripping or trimming may result in damage to existing trees, shrubs or bushes, the Contractor shall employ a licensed tree surgeon/service to oversee the work and provide protection of the trees.

**3.02 GRUBBING**

- A. Grubbing shall consist of the complete removal of all stumps, roots larger than 1-1/2 inches in diameter, matted roots, brush, timber, logs and any other organic or metallic debris not suitable for foundation purposes which are resting on, under or protruding through the surface of the ground; removal shall be to a depth of 18 inches below the subgrade. All depressions excavated below the original ground surface for or by the removal of such objects, shall be refilled with suitable materials and compacted to a density conforming to the surrounding ground surface.

**3.03 STRIPPING**

- A. Topsoil shall be stockpiled on site as directed by the Engineer. Stockpiled topsoil shall be protected until it is placed as specified. Any topsoil remaining after all work is in place shall be disposed of off site by the Contractor, unless otherwise directed by the Engineer.

#### 3.04 DISPOSAL OF CLEARED AND GRUBBED MATERIAL

- A. The Contractor shall dispose of all material and debris from the clearing and grubbing operation by hauling such material and debris away to an approved dump. The cost of disposal (including hauling) of cleared and grubbed material and debris shall be considered a subsidiary obligation of the Contractor at no additional cost to the Owner.
- B. Burning of combustible materials removed by clearing and grubbing operations will be allowed providing the Contractor obtains such permits and approvals required by local authorities. The Contractor will be responsible for controlling fires in compliance with all Federal, State, and Local laws and regulations. The securing of necessary burning permits shall be the responsibility of the Contractor. All burning is subject to the permission of the local Fire Department and/or Fire Marshall and in accordance with their requirements. No burning within limits of paving or buildings shall be allowed whatsoever. All burning shall be under the constant care of competent watchmen. Any remaining material and debris shall be properly disposed of in accordance with paragraph A above.

#### 3.05 PRESERVATION OF TREES

- A. Those trees which are designated for preservation by the Engineer shall be carefully protected from damage. The Contractor shall erect barricades, guards, and enclosures as required for the protection of the trees during all construction operations.

#### 3.06 PRESERVATION OF DEVELOPED PRIVATE PROPERTY

- A. The Contractor shall exercise extreme care to avoid unnecessary disturbance of developed private property as applicable. Trees, shrubbery, gardens, lawns, and other landscaping, which in the opinion of the Engineer must be removed, shall be replaced and replanted to restore the area to the condition existing prior to construction; such work shall be at no additional cost to the Owner.
- B. All soil preservation procedures and replanting operations shall be under the supervision of a nursery representative experienced in such operations.
- C. Improvements to the land such as fences, walls, outbuildings, and other structures which of necessity must be removed, shall be replaced with equal quality materials and workmanship at no additional cost to the Owner.
- D. The Contractor shall clean up the construction site across developed private property directly after construction is completed upon approval of the Engineer.

#### 3.07 PRESERVATION OF AGRICULTURAL PROPERTY

- A. When the route of the construction crosses agricultural property, pastures, fields under cultivation, and related areas, the Contractor shall take care to damage as little of the property as possible. Upon completion of the construction and approval of the Engineer, the Contractor shall restore the damaged area to the conditions existing prior to construction at no additional cost to the Owner. Replanting of pastures and crops shall be in strict accordance with accepted local

agricultural practices as defined by the Engineer.

- B. Should it be necessary to remove fences to facilitate construction, the Contractor shall employ the use of temporary restraining devices to prevent the ingress and egress of animals through the section of fence removed. After construction is completed, the Contractor shall restore the fence to its prior location and condition at no additional cost to the Owner.

### 3.08 PRESERVATION OF PUBLIC PROPERTY

- A. The appropriate portions of Paragraphs 3.05, 3.06 and 3.07 of this Section shall apply to the preservation and restoration of public lands, parks, rights-of-way, easements, and all other damaged areas.

**END OF SECTION**

**SECTION 02200**

**EARTHWORK**

**PART 1 - GENERAL**

**1.1 SCOPE OF WORK**

The work includes all clearing, excavation, borrow, filling, backfilling and grading indicated on the Drawings and necessary for the proper completion of the project, including for pipes, structures, and pavement.

**1.2 MEASUREMENT AND PAYMENT**

No specific payment shall be made for items covered in this section unless that item is listed in the Bid Schedule. Compensation for work not listed shall be included in the appropriate pay items for piping, manholes, pumping stations, etc., with which they are associated.

The basis of payment for unsuitable soils excavation, replacement and compaction shall be the unit prices contained in the Bid, or if these are not available, then payment will be determined in accordance with applicable provisions of the General Conditions. Quantities for unsuitable soils excavation, replacement and compaction for water and sewer pipelines will be computed using the following table regardless of the actual quantity of backfill material used. No consideration will be given to the number of truckloads of backfill delivered not the actual dimensions of the trench that is backfilled. Backfill quantities will only be based on the depth and lineal feet of the pipeline constructed. No consideration will be given for the number of manholes, sewer service laterals, or valves required.

Use of these standard table is for quantity computations purposes only and does not restrict the Contractor from following OSHA guidelines for trench excavations.

<u>DEPTH OF CUT TO PIPE INVERT</u>	<u>PAY QUANTITY IN CUBIC YARDS PER LINEAL FOOT OF PIPELINE</u>	
2' to 4'	0.40	
6' to 8'	0.80	
8' to 10'		1.30
10' to 12'		1.90
12' to 14'		2.50
14' to 16'		3.30
16' to 18'		4.20
18' to 20'		5.20
20' to 22'		6.20
22' to 24'		7.40

### 1.3 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

All work shall be performed in accordance with Florida Department of Transportation standards, specifications and indexes and in accordance with other state and local requirements.

Current editions or revisions of the following specifications and standards will apply unless specifically noted otherwise herein or on the Drawings.

A. American Society for Testing and Materials (ASTM) Standard

ASTM C 33-85	Concrete Aggregate
ASTM D 698-78	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. (2.49 Kg) Rammer and 12 in. (304.8 mm) Drop. Standard Proctor.
ASTM D 1556-82	Test Methods for Density of Soil in Place by the Sand-Cone Method.
ASTM D 1557-78	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (45 Kg) Rammer 2 and 18 in. (457 mm) Drop. Modified Proctor.
ASTM D 2487-83	Classification of Soil for Engineering Purposes
ASTM D 2922-76	Density of Soil and Soil-Aggregate in place by Nuclear Methods (Shallow Depth)
ASTM D 3017-78	Moisture Content of Soil and Soil-Aggregate in place by Nuclear Methods (Shallow Depth)

B. American Association of State Highway and Transportation Officials (AASHTO) Standards

AASHTO T-99	Standard Proctor
AASHTO T-180	Modified Proctor

### 1.4 SUBMITTALS

Contractor shall have reports submitted to the Engineer as required in the testing portion of this Section.

### 1.5 RELATED WORK

- Gravity Sanitary Sewer Systems
- Pressure Sanitary Sewer Systems
- Water Distribution Systems
- Asphaltic Concrete Paving

- Testing

## 1.6 SITE CONDITIONS

A. Character of Excavation Material: Prior to submitting his bid, the Contractor shall satisfy himself as to the character and amount of different soil materials, groundwater and the subsurface conditions to be encountered in the work to be performed. Information and data, when furnished, are for the Contractor's general information. However, it is expressly understood that any interpretation or conclusion drawn therefrom is totally the responsibility of the Contractor.

B. Subsurface Investigation: If subsurface information is included as an appendix of these specifications it is the results of soil borings and soil classification and testing made at the exact locations only. While the soil borings and information are representative of subsurface conditions at their respective exact locations, local variations in soils and groundwater will be encountered.

C. Existing Underground Facilities: Underground structures and utilities shown on the drawings are located according to the best available records. However, it shall be the Contractor's responsibility to acquaint himself with all information, and to accurately locate and uncover all underground structures and utilities along the line of work in order to avoid conflicts with existing facilities. Underground utilities shall be located by the Contractor far enough in advance of the trench or site excavation and pipe laying operations to assure ample opportunity to make the necessary adjustments to avoid conflicts. The Owner shall not be held accountable for inaccuracies or omissions in the locations or grade of facilities of this type.

D. Conflicts: Where actual conflicts are unavoidable, work shall be performed so as to cause as little interference as possible with the service rendered by the facility disturbed. The Owner may require the Contractor to work in off hours (i.e. 1:00am or Holidays) in order to minimize disturbance. Facilities or structures damaged in the prosecution of the work shall be repaired immediately in conformance with the best standard practices or according to the direction of the owner of such facility, to the extent required, including replacement, at no cost to the Owner.

## PART 2 - MATERIALS AND EQUIPMENT

### 2.1 BACKFILL

The following shall define the terms used in the plans and specifications.

A. Topsoil - shall be the upper most layer of soil usually dark in color and approximately 6 inches thick, rich in organic matter.

B. Gravel Bedding - Gravel bedding shall consist of well-graded crushed stone or crushed gravel meeting the requirements of ASTM Designation C-33, Graduation 67 (3/4-inches to No. 4). Air cooled blast furnace slag, alone or in combination with crushed stone and/or crushed gravel, conforming to ASTM C-33 requirements may also be used.

C. Select Backfill - shall be a select granular material free from organic matter and of such size and gradation that desired compaction can be readily attained. Select backfill is

defined as those complying with AASHTO soil classification Groups A-1, A-3, and A-2-4 having a maximum size not to exceed 3 inches with at least 95% passing the 1 1/2 inch sieve and not more than 15% passing the No. 200 sieve with a coefficient of uniformity of six or greater. The liquid limit shall be less than 15. In most situations the existing backfill will not meet these requirements, therefore, select backfill is material which must be transported to the site from an approved borrow pit.

D. Suitable or Common Backfill - shall be a satisfactory soil material free from organic matter, muck, marl and rock exceeding 3 inches in diameter. At least 95% shall pass the 1 1/2 inch sieve. Common backfill shall comply with AASHTO soil classification Groups of A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, and A-7 providing that the liquid limit shall be less than 35. Suitable backfill is usually considered on site material that meets these requirements.

E. Existing or Unsatisfactory Backfill - shall be material obtained from the Contractor's excavations to be used in areas not requiring specific compaction densities. This material shall not be used for pipe bedding nor under streets, street shoulders, or structures. Such backfill shall be free of debris, deleterious materials and shall contain no material larger than 6 inches. Under no conditions are destroyed pavement materials, curbs, broken concrete, etc., to be included in the backfill.

F. Concrete Encasement - shall be of portland cement type with a compressive strength at 28 days of 2500 psi.

G. Clean Sand - shall be a quartz material with less than 5 percent of the soil particles finer than the No. 200 mesh sieve, a uniformity coefficient greater than 1.5 and an effective grain size of 0.20 to 0.55 millimeters in diameter. Clean sand is required for filter material requiring good permeability.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL REQUIREMENTS**

##### A. Safety

In the Contractor's use of streets and highway for the work to be done under these Specifications he shall conform to all City, State, and local laws and regulations. The Contractor shall provide, erect, and maintain effective barricades, danger signals, and signs on all intercepted streets or highways for protection of the work and safety of the public rights-of-ways shall be provided with lights which shall be kept burning at all times between sunset and sunrise. The Contractor shall be responsible for all damages resulting from any neglect or failure to meet these requirements. Where conditions require the presence of a watchman to fulfill the requirements stated herein, same shall be furnished without extra cost to the Owner.

1. Access to Fire hydrants shall be maintained at all times. Do not block or barricade with spoil, materials or equipment for any period of time.

##### B. Maintenance of Service - Traffic

The Contractor shall arrange his work to cause minimum disturbance of normal

pedestrian and vehicular traffic and will be held responsible for providing suitable means of access to all public and private properties during all stages of the construction. A minimum of one lane of traffic shall be maintained at all times. Contractor shall keep all disturbed roads graded smooth and passable. If the road becomes impassable, the Contractor shall stabilize with dry, select backfill. The Owner may require the Contractor to work in off hours (i.e. 1:00am or Holidays) in order to minimize disturbance.

C. Maintenance of Utility Services

Should the construction work require repairs, changes or modifications of other utilities, it shall be the responsibility of the Contractor to provide for the maintenance of continuous water, electric, telephone, and gas as well as sewage and other utility services to all present customers of such utilities, unless approval in writing is secured from the utility company for interruption of such service.

Where existing septic tank service is disrupted due to construction work or is to be abandoned after connection to a new sanitary sewer system, Contractor shall provide uninterrupted service to all current septic tank users by providing pump-out of affected septic tanks if required, **at no additional cost to the Owner**. Septage pumping and disposal shall be by a licensed septage hauler.

The Owner may require the Contractor to work off hours (i.e. 1:00 a.m. or holidays) in order to minimize disruption of utility services.

D. Limits of Construction

In locations where the work is to be installed in streets or road rights-of-way the activities of the Contractor shall be confined to these public properties. Where the use of private property is deemed necessary by the Contractor to facilitate construction work arrangement for such use with the property owner shall be the responsibility of the Contractor. The Contractor shall save the Owner harmless from all claims by adjacent property owners for trespassing or damage due to the activities of the Contractor in the prosecution of the work.

E. Existing Utilities

The Contract Documents contain data relative to existing public utility installations and structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy and it is the responsibility of the Contractor to make his own investigations to inform himself fully of the character, condition and extent of all such installations and structures as may be encountered and as may affect the construction operations.

All existing improvements such as pavements, conduit, poles, pipes, overhead wires and other structures, shall be carefully supported and fully protected from injury. The Contractor shall be responsible for damages to these existing utilities and shall, in case they are damaged, restore them to their original condition at no cost to the Owner.

Contractor shall give written notice to the Owner and other governmental utility departments and other owners of public utilities of the location of his proposed construction operations, at least forty-eight hours in advance of breaking ground in any area or on any unit of work. This can be accomplished by making the appropriate contact with the utility companies listed on Sheet 2 of the Construction Drawings.

F. Property Protection

Trees, fences, poles, and all other property shall be protected unless their removal is authorized; and any property damaged shall be satisfactorily restored by the Contractor at the Contractor's expense to a condition equal to or better than that existing prior to beginning the work.

**3.2 CLEARING AND GRUBBING**

On all areas within limits of clearing and grubbing indicated on the Drawings or specified where earthwork is to be done, all timber, brush, stumps, roots, rubbish, and unsuitable material shall be removed to a depth of not less than one foot below the ground surface. Sound trees and shrubs which do not interfere with the construction and are elsewhere indicated or directed not to be removed, shall be protected properly from damage. The surface shall be plowed to a depth of not less than six (6) inches and all stumps, roots and other perishable matter thus exposed shall be removed to a depth of not less than one foot. Any deposits of muck, peat, bark or trash occurring within the limits of clearing and grubbing or where directed by the Engineer shall be removed to their full depth and backfilled with suitable backfill as specified herein. Material removed during clearing and grubbing shall be hauled to the County landfill in accordance with local laws and regulations. Landfill fees shall be paid by the Contractor. All shrubbery, ornamental trees and other such plantings including those within construction area shall be fully protected. If it becomes necessary to remove any grass, shrubbery or planting to accomplish the work, it shall be satisfactorily replaced before the work will be accepted. All areas disturbed during construction shall be restored to a condition equal to or better than that existing prior to beginning the work.

Trees and shrubs selected for preservation shall have their root systems protected from construction traffic, surface storage of materials, and any type of land disturbance within the drip line of the tree or shrub. The drip line of a tree or shrub is the outer outline of the tree crown where it intercepts the ground. Barricade all trees or tree groups which are selected for preservation if the possibility of root damage, surface soil disturbance within the drip line, soil compaction, or impact with construction equipment is prevalent. Barricading shall consist of continuous wood fencing constructed to the outline of the tree crown and shall be sturdy, highly visible and shall be maintained during the construction.

**3.3 EROSION AND FLOODING CONTROL**

During construction operations, the Contractor shall install and maintain temporary erosion and flooding control features to the extent necessary to prevent pollution of streams and lakes, detrimental effects on public or private property adjacent to the construction or damage to work on the Project. Additional erosion control devices may be requested by the Engineer to protect the property described above. This shall be done immediately when directed by Engineer at no additional cost to the Owner.

The Contractor shall attempt to limit the surface areas of erodible earth exposed by clearing and grubbing, excavation or filling operations.

Temporary features may include, but not be limited to silt fences, temporary grassing, sodding, mulching, sandbagging, slope drains, sediment basins, sediment checks, artificial coverings or berms. All City, County, State and Federal ordinances will be complied with.

The contractor shall comply with The Florida Development Manual -- A Guide to Sound Land and Water Management, Department of Environmental Regulation -- Stormwater Management Practices.

### 3.4 DUST CONTROL

If, in the opinion of the Owner or the Engineer it is necessary to control dust during construction period, the Contractor shall furnish and spread water or calcium chloride at points where dust is a nuisance, or as directed by the Engineer, at no additional cost to the Owner.

### 3.5 PAVEMENT AND SIDEWALK REMOVAL AND REPLACEMENT

A. Pavement and sidewalk shall be removed and replaced as follows unless shown otherwise on the Drawings.

B. Pavement, which is to be removed for open-cut trenching, shall be cut vertically with a power-driven friction saw prior to removal. The surface shall be scored to sufficient depth to provide uniform, straight break lines. All removal of pavement shall conform to local, County, State or Federal requirements where applicable. **Under no condition shall pavement be cut with a trenching machine, power shovel or backhoe.** Width of cut of pavement or sidewalk shall be two feet wider than top of trench, one foot on each side of trench. In the event that trench excavation becomes wider than initial cut, pavement or sidewalk shall be recut to at least one foot back from all edges of actual excavation by the Contractor at his own expense.

All cut lines shall be parallel to or at right angles to the longitudinal axis of the pipeline.

C. Pavement, driveway or sidewalk material shall be separated from other excavated materials and shall not be placed in backfill, but shall be satisfactorily disposed of by the Contractor. Base materials may be salvaged and stockpiled for reuse, but such reuse of base materials shall be subject to the review of the Engineer.

D. All pavement and sidewalk removed shall be replaced with base and surface materials which conform as closely as possible in thickness and quality to materials removed. Refer to construction drawings for pavement replacement requirements. If details are not shown in the construction drawings, the minimum pavement and pavement base replacement shall consist of 1 1/2 inch of Type S-1 asphaltic concrete surface with a 6 inch limerock base (LBR 100 compacted to 98% Modified Proctor). All painted street markings and other traffic control devices shall be restored to former conditions. Use Safety Coatings Co. Roadrunner Traffic marking paint, or approved equal, and Ferro Co. glass spheres or approved equal. Pavement with traffic control devices and sidewalks shall be replaced as soon as practicable after compaction of backfill. Replacement pavement shall be tapered at curb.

E. Workmanship and materials shall be in accordance with best standard practice for work of this type, and shall conform to the requirements of Section 330-12, Surface Requirements of Florida Department of Transportation Road and Bridge Manual.

F. All necessary barricades, detours, lights and other protective measures shall be

provided for protection of both pedestrians and vehicular traffic and shall conform to Florida DOT specifications where no local agency has specifications.

### **3.6 STATE HIGHWAY AND RAILROAD RIGHTS-OF-WAY**

Pipe crossings and installations along all railroads and State highways shall be in accordance with the applicable portions of American Railroad Engineers Association (AREA) Specifications for "Pipeline Crossing under Railroad Tracks for Non-Flammable Substances" or Florida DOT "Utility Accommodation Guide" and with details shown on the drawings. Verify the existence of a formal permit to work on the right-of-way at each specific location prior to any work at that site and notify the owner of the right-of-way as required by that permit. Furnish the Engineer and the Owner with a copy of any separate certificate of insurance that is required by the owner of the right-of-way.

### **3.7 CURB AND GUTTER REMOVAL REPLACEMENT**

Curb or curb and gutter removal, where required in construction of this work, shall be held to a minimum. Curb and gutter material to be removed shall be carefully separated from trench excavation material and shall be satisfactorily disposed of by the Contractor.

The Contractor shall replace all curb or curb and gutter which has been removed. Curb or curb and gutter shall be replaced as soon as possible after backfill is placed and compacted and shall be a duplicate in all respects to original construction. Workmanship shall be in accordance with the controlling agency (City, County, State).

### **3.8 RESTORATION OF ROADWAY CROSSINGS AND DRIVEWAY CROSSINGS**

Clay, marl, shell or similar roadways and driveways that are crossed or traversed by trenches shall be restored to existing conditions prior to excavation. The Contractor may reclaim existing material, or he may furnish and compact new material. There will be no additional compensation for this type of restoration unless specifically called for in the Special Provisions or on the Bid Proposal.

Final and complete restoration of crossings in existing public roadways shall be completed not more than 24 hours subsequent to the final lift of the backfill.

### **3.9 EXCAVATION**

#### **A. General**

Excavation shall be performed in accordance with all State, County and local regulations. Blasting will not be permitted except by written approval of the Engineer for each specific location where it is to be performed. Excavation shall conform to the dimensions indicated or specified for the pipeline or structure and topography and subgrade conditions encountered.

The Contractor shall notify the Engineer in due time to permit him to inspect completed excavations, and no pipes or concrete shall be placed in excavations or upon subgrades until they have been approved by the Engineer.

In areas where excavation may endanger existing structures, roads or utilities,

Contractor will provide suitable support to these existing facilities so as to insure that damage will not occur. Contractor shall submit proposed method of support of these facilities to the Engineer for approval. The Contractor shall obtain written approval from the facility concerned before proceeding with any construction which might undermine or endanger existing facilities.

B. Control of Water

Furnish, install and operate all necessary machinery, appliances and equipment to keep excavations free from water during construction. Dewater and dispose of water so as not to cause injury to public or private property or to cause a nuisance or a menace to the public. The Contractor shall at all times have on-hand sufficient pumping equipment and machinery in good working condition for all ordinary emergencies and shall have available at all times competent workmen for operation of pumping equipment. Dewatering systems shall not be shut down between shifts, on holidays or weekends, or during work stoppages without written approval from the Engineer.

Control of ground water shall be such that softening of the bottom of excavations or formation of "quick" conditions or "boils" shall be prevented. Dewatering systems shall be designed and operated so as to prevent removal of natural soils.

Static water level shall be drawn and maintained one-foot below bottom of excavation so as to maintain undisturbed state or natural soils and allow placement of backfill to required density. Dewatering system shall be installed and operated so that ground water level outside excavation is not reduced to extent that would damage or endanger adjacent structures or property.

Release of ground water to its natural static level shall be performed in a manner so as to maintain undisturbed state of natural foundation soils, prevent disturbance of compacted fill or backfill and prevent flotation or movement of all structures and pipelines.

Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.

C. Shoring, Sheet piling and Bracing

Excavations shall be shored and sheeted in accordance with requirements of the Department of Labor Occupational Safety and Health Administration (OSHA) with members of sizes and arrangement sufficient to prevent injury to persons, damage to structures, injurious caving, or erosion. They shall be designed, furnished, placed, maintained and removed by the Contractor. Sheet piling and shoring design shall be submitted to the Engineers as a shop drawing prior to installation and shall bear the seal of a structured engineer registered in the State of the job site.

Design, planning, installation and removal of all sheet piling, shoring, sheet piling and bracing shall be accomplished in a manner so as to maintain required trench or excavated section with an undisturbed state of soils at and below excavation bottom.

Sheet piling and timbers used in trench excavations shall be withdrawn in such a manner so as to prevent subsequent settlement or misalignment of pipe or additional backfill loadings which might overload pipe. Where, in the opinion of the Engineer,

removal of sheeting and shoring will or may cause damage to the work or to adjacent buildings, utilities or property, the Engineer may direct Contractor to leave all or a portion of sheeting and shoring in place. Sheeting and shoring shall also be provided as necessary to keep excavations within the available right-of-way.

The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his part to issue orders, and his failure to exercise his right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise growing out of a failure on the part of the Contractor to leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.

D. Excavation for Pipe System

1. Common Excavation

Machine excavation shall be carried to a depth above final pipeline grade that will allow final grading using hand tools, as indicated on the Plans. Care shall be taken to not excavate below required depth. If excavations is carried below required depth, overcut depth shall be backfilled with select backfill material or gravel bedding material furnished at Contractor's expense and compacted to provide pipe support at least equal to that of original material.

Contractor may, at his option, elect to overcut trench and backfill with select backfill or bedding material. If Contractor so elects, depth of overcut shall be such that a minimum of two inches of compacted backfill material will result under lowest projection of pipe bell. **No additional payment** will be made for this overcut or for furnishing and placing of the required backfill material.

The Contractor shall exercise sound construction practices in excavating trench and maintaining it so no damage will occur to any foundation structure, pole line, pipeline or other facility because of slough of slopes or from any other cause. If, as a result of excavation, there is a disturbance of ground that endangers other property, the Contractor shall immediately take remedial action at his own expense. No act of the Owner or his representatives shall in any way affect liability of the Contractor for damages, expenses or costs that may result from trench excavation.

Trees, stumps and roots within limits of trench excavation shall be removed to a depth of at least 12 inches below bottom of trench.

2. Trench Requirements

Width of trench banks from bottom to 12 inches above top of pipe shall not exceed 18 inches nor be less than 12 inches on each side of the pipe with the exception of preassembled pressure pipe in non-paved areas for which the minimum trench width shall be pipe diameter plus 1 inch on each side of the pipe.

Trenches for gravity sewers shall be of such depth that the invert of pipe will be at elevations shown on the plans, or as may be determined by the Engineer. Trenches shall provide a minimum cover of 36 inches for water mains and 48 inches for sewage force mains over barrel of pipe, except as otherwise

shown. Greater depth may be required to accommodate appurtenances or avoid obstruction.

Excavation for appurtenances shall be made to a size that will allow at least 12 inches between their outer surfaces and embankment or shoring.

The trench shall be **dry** when the bottom is prepared. A continuous trough shall be excavated by hand to receive the bottom 120 degrees of the pipe barrel. In addition, bell holes shall be excavated so that only the barrel of the pipe receives bearing pressure from, and is uniformly supported by, the bottom of trench. Preparation of trench bottom and placement of pipe shall be such that final position of pipe is true to line and grade and uniformly supported throughout barrel of each pipe length. When pipe is placed in select backfill over rock or other overdepth, additional backfill of same material shall be tamped on each side of barrel to height of spring line, thus forming a trough of firm, compacted bedding.

### 3. Pipe Interferences and Encasements

In no case shall there be less than 4 inches between any two pipelines or between pipelines and structures. Pipe deflections shall be performed in accordance with the plans and as contained herein. Wherever there is more than 4 inches but less than 18 inches clearance between sewers, sewer house laterals, force mains and water mains or water services, then a concrete encasement shall be provided for a distance of 10 feet on each side of the obstruction pipe. Wherever there is more than 4 inches but less than 1.0 foot clearance between any two pipe lines, other than water or sewer, or between pipe lines and structures, then a concrete encasement shall be provided for a distance of 3 feet on each side of the obstruction pipe.

The Engineer shall have full authority to direct the placement of the various pipes and structures in order to facilitate construction, expedite completion and to avoid conflicts.

### E. Excavation for Structures

Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection, or as shown on the Drawings.

In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive concrete.

In areas underlain by expansive clay, undercutting or excavation of clay pockets will be required beneath footings and slab areas as may be shown on the drawings and directed by the Engineer. Post-hole diggers may be used to determine the depth to the clay materials in all of the footing bottoms. Heavy clay that is encountered within a zone that is four (4) feet below the bottom of any footing or floor slab should be undercut and

replaced with suitable or common backfill material. The width of undercutting in the footing should extend at least four (4) feet beyond the edge of the footing or slab to provide a non-expansive water barrier above the clay. Other clay pockets discovered during construction may also require complete removal upon the recommendation of the geotechnical engineer.

F. Unsuitable Material

Unsuitable materials are soils exposed at the bottom of excavations that are compressible, expansive, contain extraneous rubble, or offer uneven foundation support. Unsuitable materials/soils will include, but not be limited to, mulch, peat, expansive clays, boulders, rubble, any portion of trees or similar vegetation, wood, or unyielding material such as rock.

The Contractor shall notify the Engineer immediately when unsuitable material is encountered. The Engineer will investigate questionable material to determine its suitability. Should the Engineer require soils testing be performed to aid in his determination, then tests revealing suitable materials shall be paid for by the Contractor.

Where the Engineer determines that unsuitable material is present below the excavation which will not provide adequate support the Contractor shall remove the unsuitable material as directed by the Engineer and replace the unsuitable material with Select backfill. Prior to the excavation of any unsuitable material, written approval must be obtained from the Engineer. The approval shall state the linear feet of excavation. No payment shall be made for the removal of any unsuitable bedding material if prior approval is not obtained.

**3.10 BACKFILL AND COMPACTION FOR PIPES**

A. General

Contractor shall not perform any backfilling operation other than that necessary to hold pipe in place until the locations of connections and appurtenances have been recorded on the "as-built" drawings and the line has been inspected and released for backfilling. Backfill and compaction shall be performed as specified herein and as shown on the drawings. Backfilling of trenches shall progress as rapidly as the construction, testing and acceptance of work permits. In areas subject to traffic temporary backfill or base material is required to provide a smooth stable driving surface until final base and/or pavement can be constructed.

B. Haunching and Initial Backfill

After pipe has been properly laid and inspected backfill shall be carefully placed and compacted around the pipe in loose horizontal layers not exceeding 6 inches loose depth, equally on both sides of pipe and shall be spaded (walked in) and compacted with hand tampers to obtain the required density. This shall continue to a level of one foot above the top of the pipe.

C. Subsequent Backfill

Above the level of initial backfill, the trench shall be filled in horizontal layers and mechanically compacted to the density required up to 3 feet below the base of pavement

or structures, up to 6 inches in areas to receive topsoil, seeding, or soiling and up to final grade in non-paved streets.

D. Backfill and Compaction Requirements for Pipe (unless shown differently on the plans)

1. Paved Areas

- a. Initial - Select backfill in 6" lifts at 100%.
- b. Subsequent - Select backfill in 8" lifts at 100%.
- c. Top 3 feet below road base - Select backfill in 6" lifts at 100%.

2. Unpaved Street and Street Shoulder Areas

- a. Initial - Suitable backfill in 6" lifts at 95%.
- b. Subsequent - Suitable backfill in 8" lifts at 95%.

3. Off Street Areas

- a. Initial - Suitable backfill in 6" lifts at 95%.
- b. Subsequent - Unsuitable or existing backfill in 18" lifts compact till firm.

NOTE: Density listed are maximum dry density in accordance with AASHTO T-99 Standard Proctor Density.

### **3.11 BACKFILL AND COMPACTION FOR STRUCTURES**

For the area under the structure and within a 2 foot of the perimeter, compact the top 12 inches of subgrade and each 6 inch layer of select backfill or fill material to 100% Standard Proctor density.

### **3.12 GRADING**

Grading shall be performed at such places as are indicated on the drawings, to the lines, grades, and elevations shown or as directed by the Engineer and shall be made in such a manner that the requirements for formation of embankments can be followed. All unacceptable material encountered, of whatever nature within the limits indicated, shall be removed and disposed of as directed. During the process of excavation, the grade shall be maintained in such condition that it will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the prosecution or condition of the work.

Grade all areas as indicated. Fill shall be brought to finish grades shown and shall be graded to drain water away from structures.

Overall area grading for which no grades are indicated within the limits of construction and outer limits of clearing and grubbing, all holes and other depressions shall be filled, all

mounds and ridges cut down and the area brought to sufficiently uniform contour that the Owner's subsequent mowing operations will not be hindered by irregular terrain. This work shall be done regardless of whether the irregularities were the result of the Contractor's operations or originally existed. Permanent ponds or other permanent water areas, as so designated by the Engineer, will not be required to be filled.

### 3.13 TESTING

#### A. General

Contractor shall comply and pay for the services of an independent testing laboratory in accordance with Section 01410 "Testing and Laboratory Services" to perform testing specifically indicated herein.

Exact location of the test shall be selected by the Engineer or his representative. If the Engineer, after being notified by the Contractor, is unable to be present during the test, the laboratory personnel shall randomly select testing locations that are representative of the work being tested. All cost of this testing and providing of certificates shall be a subsidiary obligation of the Contractor with the cost included in the item for which the testing is associated.

The minimum testing rate shall not prevent the Contractor nor the testing laboratory from performing additional testing to insure the construction is in accordance with the plans and specifications.

A minimum of two (2) copies of reports of test results of all maximum dry density and optimum moisture content determinations and all in-place density tests shall be submitted to the Engineer. Reports must be signed by a registered Professional Engineer.

The Contractor shall repair all test holes and borings resulting from the testing and retesting of his work at no cost to the Owner.

Any areas failing to pass the tests as called for, and interpreted by the Engineer, shall immediately be brought into conformance with these Specifications at the Contractor's expense.

#### B. Minimum Schedule of Test Required

1. Determination of the soil classification for each type of soil material used to determine its suitability for use as defined herein and in accordance with the AASHTO or Unified Soil Classification System.

2. Determination of maximum dry density and optimum moisture content for each type of soil to be compacted to a specified density. At least one determination will be made for each soil used. Tests shall be performed in accordance with the appropriate ASTM or AASHTO Standards.

3. In-place (insitu) density test shall be made in accordance with ASTM and AASHTO Standards and shall be made at a frequency to assure contract requirements are met but in no case less than the following:

- a. Pipeline backfill at the rate of one test for each 50 linear feet of trenchline for each backfill lift. A backfill lift shall never be considered to be greater than one foot in thickness. In unpaved areas, testing rate by be reduced to one test for each 150 lineal feet of trenchline for each backfill lift.
- b. Structure backfill at the rate of one test for each 2000 square feet for each backfill lift (maximum lift of 12 inches).
- c. Pavement, sidewalk and curb backfill at the rate of one test for each 50 lineal feet of street for each backfill lift (maximum lift of 12 inches).

### **3.14 MAINTENANCE**

Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

**END OF SECTION**

## **SECTION 02300**

### **BORING AND JACKING**

#### **PART 1 - GENERAL**

##### **1.1 SCOPE**

- A. The Contractor shall supply all labor, equipment, materials, and incidentals necessary to install all piping and appurtenances as shown on the drawings and as specified herein.
- B. This work shall include, but not be limited to, the following: boring and jacking pits and equipment, sheeting, steel casing pipe, galvanized steel vent pipe, skids, steel straps, masonry seals, coatings, location signs as required, miscellaneous appurtenances and restoration.
- C. Construction methods, procedures and materials for work performed within FDOT right-of-ways shall conform to FDOT Section 556, Jack and Bore.

##### **1.2 RELATED WORK**

- A. Earthwork
- B. Water Distribution Systems
- C. Sanitary Sewers
- D. Sewage Force Mains

##### **1.3 SUBMITTALS**

Submit shop drawings to the Engineer for review in accordance with the requirements of Section 01340, showing a sketch of the jacking pit locations, and method proposed for boring and jacking the casing pipe. The Contractor shall also submit a list of materials to be furnished, recent certified mill test reports, and the name of the suppliers.

Submit copy of separate Certificate of Insurance for each right-of-way owner showing per amount of insurance required by that owner.

##### **1.4 BASIS OF PAYMENT**

The length of highway or railroad crossing to be measured for payment will be the actual length of steel casing pipe installed at each location shown, except that no measurement will be allowed for lengths that exceed the distances shown on the plans without prior written approval of the Engineer.

Payment for jacking and boring highway or railroad crossings will be at the unit price per linear foot inserted in the bid Form for the size of casing pipes and type of materials used regardless of depth. Unit price will constitute compensation in full for all special insurance, labor, materials, equipment, dewatering, excavating, backfilling, casing pipe, threading or inserting the carrier pipe into the casing pipe and connecting the carrier pipe to the main line, skids, bands, fittings, testing and supplies required for each installation, and all grassing work. Carrier pipe paid for under this item shall not be included for payment under other items.

## **PART 2 - PRODUCTS**

### **2.1 ENCASEMENT PIPE MATERIAL**

Encasement pipe for railroad and highway crossings shall be steel casing pipe having a minimum yield strength of 35,000 psi and conforming to ASTM Designation A53-84, Grade B. The following minimum nominal diameter and thickness of casing pipe shall be used. When the casing pipe size is indicated on the plans, the size so indicated shall be furnished.

Diameter of Carrier Pipe (inches)	Nominal Diameter of Casing Pipe (inches)	Minimum Thickness of Casing Pipe (inches)
24	36	0.500
20	28	0.500
18	26	0.500
16	24	0.375
14	22	0.375
12	20	0.375
10	18	0.312
8	16	0.250
6	12	0.250
4	12	0.250
3	8	0.250
2 and smaller	6	0.280

The inside diameter of the casing pipe shall be great enough to allow the carrier pipe to be installed and removed without disturbing the casing pipe or the roadbed. Pipe shall be supported within casing as shown on the plans.

Field and shop welds of the casing pipes shall conform with the American Welding Society standard specifications. Field welds shall be complete penetration, single-vee groove or single-bevel groove type joints. All welding shall be performed by certified welders.

### **2.2 CARRIER PIPE**

Carrier pipes shall be of materials shown on the drawings and meet all of the requirements of the following Sections as applicable; Water Distribution System, Sanitary Sewers, and Sewage Force Mains.

## PART 3 - EXECUTION

### **3.1 ENCASEMENT CONSTRUCTION**

The Contractor shall install encasement pipe at the location, depth, and grade indicated on the Drawings and as specified herein. All work shall be performed by a qualified Contractor or Subcontractor regularly engaged in that type of work. The owner will obtain the necessary permits for construction across the highways. The Contractor shall abide by all rules, regulations, and requirements of the owners of such property in regard to construction under this Contract, including the giving of notices, provisions for inspections, and employment of such methods of construction as may be required. In case of no established rules, regulations and requirements, the requirements of the American Railroad Engineers Association "Specification for Pipeliners Crossing under Railroad Tracks for Non-Flammable Substances" or of the Florida Department of Transportation "Utility Accommodation Guide", latest edition, shall prevail. Whenever additional costs are anticipated due to such requirements, all such costs shall be included in the prices bid. No additional compensation will be allowed for such costs after award of the Contract. Welding equipment, boring and jacking equipment, flood lights, and all emergency equipment shall be on the site and in first class working condition before the casing installation will be permitted. The face of the roadbed shall be sheeted as required to prevent all roadbed earth movement, and under no circumstances may anchors or deadmen be installed in the roadbed. Construction shall not begin until the Engineer's approval has been obtained. When boring and jacking has been started the operation shall continue, without interruption, until the crossing is completed. All existing facilities and utilities shall be properly supported and fully protected from damage. Maximum permissible encasement variation from the alignment and grade indicated on the Drawings shall be as follows:

A. For Gravity Lines:

Alignment = 1.0 percent from the vertical plane  
Grade = 0.5 percent greater, but 0.0 percent  
less than grade indicated on the Drawings

B. For Pressure Lines:

Alignment = 2.0 percent from the vertical plane  
Grade = 2.0 percent from the horizontal plane

Casing pipe shall be constructed so as to prevent leakage throughout its entire length. After construction, the interior of the casing pipe shall be kept clean and free of debris, soil and other foreign matter by means of a temporary, removable watertight plug until the pipe is laid in the casing and the ends sealed. Non-shrinking grout shall be used as a sealant and shall be of sufficient strength for restraining the external earth loads. The Contractor shall repair any settling occurring over encasements installed under this Contract within the period of the General Guarantee. Such repair work shall be at no cost to the owner. Downstream construction of water mains, force mains or gravity sewer lines shall not proceed closer than 50 feet from a cased crossing until the casing has been constructed and inspected by the Engineer.

**SECTION 02600**

**INSTALLATION OF FUSIBLE PVC PIPE BY HORIZONTAL DIRECTIONAL DRILLING (HDD)**

**PART 1 –GENERAL**

1.01 DESCRIPTION

A SCOPE

1. This section specifies the installation of fusible polyvinyl chloride (PVC) pipe by horizontal directional drilling, directional boring, or guided boring, including standards for safe handling and storage, dimensionality, quality, acceptable fusion practice, directional drilling and pipe pull-back operations, testing and cleanup.

B REQUIREMENTS

1. Contractor shall provide fusible polyvinyl chloride (PVC) pipe conforming to all standards and procedures, and meeting all testing and material properties as described in this specification for installation by horizontal directional drilling, directional boring, or guided boring.
2. Contractor shall be responsible for all installation processes and procedures associated with the installation by horizontal directional drilling, directional boring, or guided boring in accordance with this specification.

C PIPE DESCRIPTION

1. Pipe Supplier shall furnish fusible polyvinyl chloride (PVC) pipe conforming to all standards and procedures, and meeting all testing and material properties as described in this specification.
2. Pipe shall conform to the following table of dimensions and designations:

<u>Pipe Name &amp; Reference Standard</u>	<u>Nominal Diameter (in.) &amp; Convention (e.g., CIOD, IPS, or other)</u>	<u>Dimension Ratio (DR)</u>	<u>Pressure Class or Rating (psi)</u>	<u>Average Outside Diameter (in.)</u>
Potable Water Main, AWWA C900	12" CIOD	18	235 psi	13.2"
Potable Water Main, AWWA C900	10" CIOD	18	235 psi	11.1"
Potable Water Main, AWWA C900	4" CIOD	18	235 psi	4.8"

## 1.02 QUALITY ASSURANCE

### A REFERENCES

1. This section contains references to the following documents. They are a part of this section as specified and modified. In the event of a conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.
2. Construction methods, procedures and materials for work performed within FDOT right-of-ways shall conform to FDOT Section 555, Directional Bore.
3. Unless otherwise specified, references to documents shall mean the documents in effect at the time of design.

Reference	Title
ANSI/AWWA C110/A21.10	Standard for Ductile-Iron and Gray-Iron Fittings
ANSI/AWWA C111/A21.11	Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
ANSI/AWWA C153/A21.53	Standard for Ductile-Iron Compact Fittings for Water Service
AWWA C605	Standard for Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings
AWWA C651	Standard for Disinfecting Water Mains
AWWA C900 <sup>1</sup>	Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 in. through 60 in. (100mm Through 1,500mm)
AWWA C907	Standard for Injection-Molded Polyvinyl Chloride (PVC) Pressure Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water, Wastewater, and Reclaimed Water Service
AWWA M23	AWWA Manual of Practices for PVC Pipe—Design and Installation
ASTM C923	Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
ASTM D1784	Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D1785	Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2241	Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)

<sup>1</sup> Prior to 2017, AWWA C905 was the standard for PVC pipe and fabricated fittings larger than 12 in. (300 mm). “AWWA C905” marking on pipe larger than 12 in. is acceptable.

Reference	Title
ASTM D2665	Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
ASTM D3034	Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F679	Standard Specification for Poly(Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings
ASTM F1417	Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air
UNI-B-6	Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe
UNI-PUB-08	PVC Pressure Pipe Tapping Guide
NSF/ANSI – 61-G	Drinking Water System Components--Health Effects
PPI TR-2	PVC Range Composition Listing of Qualified Ingredients

**B MANUFACTURER REQUIREMENTS**

1. All piping shall be made from PVC compound having a minimum cell classification of 12454 per ASTM D1784.

**C FUSION TECHNICIAN REQUIREMENTS**

1. Fusion technician shall be qualified by the pipe supplier to install fusible polyvinyl chloride (PVC) pipe of the type(s) and size(s) being used. Qualification shall be current as of the actual date of fusion performance on the project.

**D WARRANTY**

1. The pipe shall be warranted for one year per the pipe supplier's standard terms.
2. In addition to the standard pipe warranty, the fusion services shall be warranted for one year per the fusion service provider's standard terms.

**E PRE-CONSTRUCTION SUBMITTALS**

1. The Contractor shall submit the following PRODUCT DATA to the Engineer:
  - a) Pipe Size
  - b) Dimensionality
  - c) Pressure Class or Pressure Rating per applicable standard
  - d) Color
  - e) Recommended Minimum Bending Radius

- f) Recommended Maximum Safe Pull Force
  - g) Fusion technician qualification indicating conformance with this specification
2. The Contractor shall submit the following WORK PLAN AND INFORMATION to the Engineer. This WORK PLAN AND INFORMATION shall also be supplied to the pipe supplier upon request:
- a) Work plan shall include for each HDD installation any excavation locations and dimensions, interfering utilities, bore dimensions and locations including bend radii used, and traffic control schematics.
  - b) A project safety and contingency plan which shall include but shall not be limited to drilling fluid containment and cleanup procedures, equipment and plan for compromised utility installations including electrical and power lines, water, wastewater and any other subsurface utility in the area.
  - c) An HDD schedule identifying daily work hours and working dates for each installation.
3. The Contractor shall submit documentation of compliance with the following minimum standards to the Engineer:
- a) The directional drilling specialty provider shall be an experienced, licensed contractor specializing in guided directional drilling and whose key personnel assigned to this work shall have a minimum of five (5) years of related directional drilling experience.
  - b) The directional drilling specialty provider shall have experience in sand and rock drilling.
  - c) Pre-Approved directional drilling specialty provider: Underground Solutions, Inc., Poway, CA, (858) 679-9551.

F POST-CONSTRUCTION SUBMITTALS

1. The Contractor shall submit the following documentation to the Engineer:
- 1) Approved datalogger device reports
  - 2) Fusion joint documentation containing the following information:
    - a) Pipe Size (Diameter) and Wall Thickness
    - b) Fusion Machine Size (Make & Model Number)
    - c) Fusion Technician Identification
    - d) Job Identification (Name, location & project number)
    - e) Fusion Joint Number
    - f) Fusion, Heating, Cool Down and Drag Pressure Settings
    - g) Heat Plate Temperature

- h) Time Stamp
  - i) Fusion Heating and Cool Down Time
  - j) Ambient Temperature and Weather Conditions
- 3) As-recorded Information
- a) The as-recorded plan and profile will reflect the actual installed alignment, and reflect the horizontal offset from the baseline and depth of cover.
  - b) All fittings, valves, or other appurtenances will also be referenced and shown.
  - c) A daily project log, along with tracking log sheets, should they be used, shall be provided. Tracking log sheet data, should it be employed, shall include all that apply, including inclination, depth, azimuth, and hydraulic pull-back and rotational force measured.

## **PART 2 – PRODUCTS**

### **2.01 FUSIBLE POLYVINYL CHLORIDE (PVC) PIPE FOR POTABLE WATER, RECLAIMED WATER, AND WASTEWATER**

- A Fusible polyvinyl chloride (PVC) pipe shall conform to AWWA C900, ASTM D2241 or ASTM D1785, as applicable. Testing shall be in accordance with the test methods provided or referenced in the applicable pipe standard.
- B Fusible polyvinyl chloride (PVC) pipe shall be extruded with plain ends. The ends shall be square to the pipe and without any bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe unless specified for connections with appurtenances or for connections at the fusible pipeline termination locations.
- C Fusible polyvinyl chloride (PVC) pipe shall be manufactured in a standard 40' or 45' nominal length, or custom lengths as specified.
- D Fusible polyvinyl chloride (PVC) pipe for potable water use shall be blue in color.
- E Marking on the pipe shall include:
  - 1. Pipe size (nominal diameter)
  - 2. PVC
  - 3. Pipe Dimension Ratio (DR), Standard Dimension Ratio (SDR), or Schedule (SCH)
  - 4. AWWA pressure class, or ASTM pressure rating, as applicable,
  - 5. Designation of the applicable AWWA or ASTM standard, (e.g., "AWWA C900")

6. Extrusion production-record code
7. Trademark or trade name
8. Cell Classification 12454 and/or PVC material designation code 1120 may also be included
9. NSF-61-G (designating suitability for potable water service, including the lead-free requirements of the Safe Drinking Water Act) on all potable water pipe.

F Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other visible deleterious faults.

## 2.02 TRACER WIRE

A Tracer wire for directional boring installation shall be a 12 AWG solid, PRO-TRACE HDD-CCS PE45 or approved equal. Conductor shall be hard-drawn, 21% IACS, copper clad steel, utilizing a AISI 1065 high carbon steel core (required to meet a break load), with rated break load of 1,330 lbs (260,000 psi). Conductor shall be extruded with a 45mil, high density, high molecular weight polyethylene (HMW-HDPE) pursuant to ASTM D1248 Standard.

## 2.03 FUSION JOINTS

A Unless otherwise specified, fusible polyvinyl chloride (PVC) pipe lengths shall be assembled in the field with butt-fused joints. The Contractor shall follow the pipe supplier's written guidelines for this procedure. All fusion joints shall be completed as described in this specification.

## 2.04 CONNECTIONS AND FITTINGS

### A DUCTILE IRON MECHANICAL AND FLANGED FITTINGS

Acceptable fittings for use with fusible polyvinyl chloride (PVC) pipe shall include standard ductile iron fittings conforming to AWWA/ANSI C110/A21.10, or AWWA/ANSI C153/A21.53 and AWWA/ANSI C111/A21.11.

1. Connections to fusible polyvinyl chloride (PVC) pipe may be made using a restrained or non-restrained retainer gland product for PVC pipe, as well as for MJ or flanged fittings.
2. Ductile iron fittings shall be restrained with the use of thrust blocking or other means as indicated in the construction documents.
3. Ductile iron fittings and glands must be installed per the manufacturer's guidelines.

### B PVC GASKETED, PUSH-ON FITTINGS

Fittings for use with fusible polyvinyl chloride (PVC) pipe shall include standard PVC pressure fittings conforming to AWWA C900 or AWWA C907.

1. Fittings for use joining fusible polyvinyl chloride (PVC) pipe with other sections of fusible polyvinyl chloride (PVC) pipe or other sections of PVC

pipe shall include gasketed PVC, push-on type couplings and fittings, including bends, tees, and couplings as shown in the construction documents.

2. PVC gasketed, push-on fittings and mechanical restraints, if used, shall be installed per the manufacturer's guidelines.

#### C FUSIBLE POLYVINYL CHLORIDE (PVC) SWEEPS OR BENDS

1. Fusible polyvinyl chloride (PVC) sweeps or bends shall be manufactured from the same fusible polyvinyl chloride (PVC) pipe being used for the installation and be of the same sizing convention, diameter, wall thickness and pressure class of the pipe being joined using the sweep or bend.
2. Fusible polyvinyl chloride (PVC) sweeps or bends shall have at least 2 feet of straight section on either end of the sweep or bend to allow for fusion of the sweep to the pipe installation. Unless otherwise specified, there shall be no gasketed connections utilized with a fusible polyvinyl chloride (PVC) sweep.
3. Standard fusible polyvinyl chloride (PVC) sweep or bend angles shall not be greater than 22.5 degrees, and unless otherwise specified, shall be used in nominal diameters ranging from 4-inch through 16-inch.

#### D SLEEVE-TYPE COUPLINGS

1. Sleeve-type mechanical couplings shall be manufactured for use with PVC pressure pipe.
2. Sleeve-type couplings shall be rated at the same or greater pressure carrying capacity as the pipe itself.

#### E EXPANSION AND FLEXIBLE COUPLINGS

1. Expansion-type mechanical couplings shall be manufactured for use with PVC pipe, and may be restrained or unrestrained as indicated in the construction documents.
2. Expansion-type mechanical couplings shall be rated at the same or greater pressure carrying capacity as the pipe itself.

#### F CONNECTION HARDWARE

Bolts and nuts for buried service shall be made of non-corrosive, high-strength, low-alloy steel having the characteristics specified in ANSI/AWWA C111/A21.11, regardless of any other protective coating.

#### G CONNECTION TO SANITARY SEWER MANHOLES AND STRUCTURES

1. Fusible polyvinyl chloride (PVC) pipe shall be connected to manholes and other structures to provide a leak-free, properly graded flow into or out of the manhole or structure.
2. Connections to existing manholes and structures shall be as indicated in the construction documents.
  - 1) For a cored or drilled opening provide a flexible, watertight connection that meets and/or exceeds ASTM C923.

- 2) For a knock out opening, provide a watertight connection (waterstop or other method) meeting the material requirements of ASTM C923 that is securely attached to the pipe with stainless steel bands or other means.
  - 3) Grout opening in manhole wall with non-shrink grout. Pour concrete collar around pipe and outside manhole opening. Provide flexible pipe joint or flexible connector within 2 feet of the collar.
3. Connections to a new manhole or structure shall be as indicated in the construction documents.
    - a) A flexible, watertight gasket per ASTM C 923 shall be cast integrally with riser section(s) for all precast manhole and structures.
    - b) Drop connections shall be required where shown on drawings.
    - c) Grout internal joint space with non-shrink grout.

## 2.05 DRILLING SYSTEM EQUIPMENT

### A GENERAL

1. The directional drilling equipment, as a minimum, shall consist of a directional drilling rig of sufficient capacity to perform the bore(s) and pull-back of the pipe(s), a drilling fluid mixing & delivery system of sufficient capacity to successfully complete the crossing, a guidance system to accurately guide boring operations, and trained and competent personnel to operate the system. All equipment shall be in good, safe operating condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this project. All required equipment shall be included in the emergency and contingency plan as submitted per these specifications.

### B DRILLING RIG

1. The directional drilling machine shall consist of a hydraulically powered system to rotate, push and pull drill pipe while delivering a pressurized fluid mixture to a drill head. The machine shall be anchored to withstand the pulling, pushing and rotating forces required to complete the project.
2. The drilling rig hydraulic system shall be of sufficient pressure and volume to power drilling operations. The hydraulic system shall be free from leaks.
3. The drilling rig shall have a system to monitor pull-back hydraulic pressure during pull-back operations.

### C DRILL HEAD

1. The horizontal directional drilling equipment shall produce a stable fluid lined tunnel with the use of a steer-able drill head and any subsequent pre-reaming heads.
2. The system must be able to control the depth and direction of the drilling operation.
3. Drill head shall contain all necessary cutters and fluid jets for the operation,

and shall be of the appropriate design for the ground medium being drilled.

## D DRILLING FLUID SYSTEM

### 1. DRILLING FLUID (DRILLING MUD)

- a) Drilling fluid shall be composed of clean water and the appropriate additive(s) for the fluid to be used. Water shall be from a clean source and shall meet the mixing requirements of the mixture manufacturer(s).
- b) The water and additives shall be mixed thoroughly to assure the absence of any clumps or clods. No hazardous additives may be used.
- c) Drilling fluid shall be maintained at a viscosity sufficient to suspend cuttings and maintain the integrity of bore wall(s).
- d) Drilling fluid shall be disposed of off-site in accordance with local, state and federal requirements and/or permit conditions.
- e) No additional chemicals or polymer surfactants shall be allowed to be added to the drilling fluid unless they have been submitted per this specification.

### 2. MIXING SYSTEM

- a) A drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid for the project.
- b) The mixing system shall be able to ensure thorough mixing of the drilling fluid. The drilling fluid reservoir tank shall be sized for adequate storage of the fluid.
- c) The mixing system shall continually agitate the drilling fluid during drilling operations.

### 3. DRILLING FLUID DELIVERY AND RECOVERY SYSTEM

- a) The drilling fluid pumping system shall have a minimum capacity to supply drilling fluid in accordance with the drilling equipment pull-back rating at a constant required pressure.
- b) The delivery system shall have filters or other appropriate in-line equipment to prevent solids from being pumped into the drill pipe.
- c) Used drilling fluid and drilling fluid spilled during drilling operations shall be contained and properly disposed of. The use of spill containment measures shall be maintained around drill rigs, drilling fluid mixing system, entry and exit pits and drilling fluid recycling system (if used) to prevent spills into the surrounding environment. Pumps, vacuum truck(s), and/or storage of sufficient size shall be in place to contain excess drilling fluid.
- d) A closed-loop drilling fluid system and a drilling fluid cleaning system should be used to whatever extent practical, depending upon project size and conditions. Under no circumstances shall drilling fluid that has escaped containment be reused in the drilling system.

## E DRILLING CONTROL SYSTEM

1. Calibration of the electronic detection and control system shall be verified prior to the start of the bore.
2. The drilling head shall be remotely steer-able by means of an electronic or magnetic detection system. The drilling head location shall be monitored in three dimensions:
  - a) Offset from the baseline,
  - b) Distance along the baseline, and
  - c) Depth of cover.
3. Point of rotation of the head shall also be monitored.
4. For gravity application and on-grade drilling, sonde/beacon or approved equipment applicable for grade increments of 1/10<sup>th</sup> of one percent shall be used.

### 2.06 PIPE PULL HEADS

- A Pipe pull heads shall be utilized that employ a positive through-bolt design assuring a smooth wall against the pipe cross-section at all times.
- B Pipe pull heads shall be specifically designed for use with fusible polyvinyl chloride (PVC) pipe, and shall be as recommended by the pipe supplier.

### 2.07 PIPE ROLLERS

- A Pipe rollers, if used, shall be of sufficient size to fully support the weight of the pipe during handling and pullback operations.
- B A sufficient quantity of rollers and spacing, per the pipe supplier's guidelines shall be used to assure adequate support and excessive sagging of the product pipe.

## PART 3 – EXECUTION

### 3.01 DELIVERY AND OFF-LOADING

- A All pipe shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the owner or engineer.
- B Each pipe shipment shall be inspected for damage and to determine if the load has shifted prior to unloading. The owner or engineer shall be notified immediately if more than immaterial damage is found. Each pipe shipment should be checked for quantity and proper pipe size, and type.
- C Pipe should be loaded, off-loaded, and otherwise handled following all of the pipe supplier's guidelines.
- D Off-loading devices such as chains, wire rope, chokers, or other pipe handling implements that may scratch, nick, cut, or gouge the pipe are strictly prohibited.

- E During off-loading and handling, care shall be taken to avoid the pipe striking hard objects. Significant impact could cause damage, particularly during cold weather.
- F If appropriate unloading equipment is not available, pipe may be unloaded by removing individual pieces. Care should be taken to ensure that pipe is not dropped or damaged. Pipe should be carefully lowered, not dropped, from trucks.

### 3.02 HANDLING AND STORAGE

- A Visibly damaged pipe sections, or sections with suspected damage shall be cut out and removed. Cutting shall be performed per the pipe supplier's recommendations.
- B Any scratch or gouge greater than 10% of the wall thickness will be considered significant and can be rejected unless determined acceptable by the owner or engineer.
- C Pipe lengths should be stored and placed on level ground. Pipe should be stored at the job site in the unit packaging provided by the manufacturer. Caution should be exercised to avoid compression, damage, or deformation to the ends of the pipe. The interior of the pipe, as well as all end surfaces, should be kept free from dirt and foreign matter.
- D Pipe shall be handled and supported with the use of woven fiber pipe slings or approved equal. Care shall be exercised when handling the pipe to not cut, gouge, scratch or otherwise abrade the piping in any way.
- E If pipe is to be stored for periods of 1 year or longer, the pipe should be shielded from direct sunlight. The pipe cover should be opaque and provide for adequate air circulation above and around the pipe to prevent excess heat accumulation.
- F Pipe shall be stored and stacked per the pipe supplier's guidelines.

### 3.03 FUSION PROCESS

#### A GENERAL

1. Fusible polyvinyl chloride (PVC) pipe will be handled in a safe manner before, during, and after the fusion process and in accordance with this specification and pipe supplier's guidelines.
2. Each length of pipe shall be inspected and cleaned as necessary to be free of debris immediately prior to joining.
3. The fusible polyvinyl chloride (PVC) pipe shall be fused together according to manufacturer's specifications.
4. Fusible polyvinyl chloride (PVC) pipe will be fused by qualified fusion technicians, as documented by the pipe supplier.
5. Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine.
6. Only appropriately sized and outfitted fusion machines that have been

approved by the pipe supplier shall be used for the fusion process. Fusion machines must incorporate the following elements:

- a) HEAT PLATE - Heat plates shall be in good condition with no deep gouges or scratches. Plates shall be clean and free of any debris or contamination. Heater controls shall function properly; cord and plug shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe supplier's guidelines.
  - b) CARRIAGE – Carriage shall travel smoothly with no binding at low pressure. Jaws shall be in good condition with proper and clean inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.
  - c) GENERAL MACHINE - Overview of machine body shall yield no obvious defects, missing parts, hydraulic leaks or potential safety issues prior to fusion.
  - d) DATA LOGGING DEVICE – An approved, fully functional datalogging device, with the current version of the pipe supplier's software shall be used. Datalogging device operations and maintenance manual shall be kept with the unit at all times. If fusing for extended periods of time, an independent 110V power source shall be available to extend battery life.
7. Other equipment specifically required for the fusion process shall include the following:
- a) Pipe rollers shall be used for support of pipe to either side of the machine
  - b) An infrared (IR) pyrometer, with an accuracy of 1% or better, for checking pipe and heat plate temperatures.
  - c) Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.
  - d) Facing blades specifically designed for cutting fusible polyvinyl chloride (PVC) pipe shall be used.
  - e) For fusion in inclement weather, and/or windy conditions; a weather protection canopy with sides that allow full machine motion of the heat plate, fusion assembly and carriage shall be provided per the pipe supplier's recommendations. When the pipe temperature is below 40°F, the pipe supplier's cold weather operating procedures shall be followed.

## B JOINT RECORDING

Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine hydraulic system. The fusion data logging and joint report shall be generated by software developed specifically for

the butt-fusion of fusible polyvinyl chloride (PVC) pipe. The software shall register and/or record the parameters required by the pipe supplier and these specifications. Required data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report.

### 3.04 DRILLING OPERATIONS

#### A GENERAL

1. Bore path and alignment are as indicated in the contract documents. The path of the bore may be modified based on field and equipment conditions. Entry and exit locations and control-point elevations shall be maintained as indicated in the contract documents.
2. It is the Contractor's responsibility to maintain minimum separation distances between the water main and other utilities and structures in compliance with FDEP standards.
3. Bend radii shown in the contract documents are minimum allowable radii and shall not be reduced.
4. The Contractor shall provide all material, equipment, and facilities required for directional drilling. Proper alignment and elevation of the opening shall be consistently maintained throughout the directional drilling operation. Entrance and exit angles for the drill are at the Contractor's discretion such that the elevation profile maintains adequate ground cover to reasonably precaution against hydraulic fractures with the drilling fluid and maintain the minimum cover shown in the Drawings and specified herein. The Contractor will be responsible for ensuring that entrance and exit angles allow for pullback forces. If entrance or exit angles exceed 15 degrees, the Contractor must submit for review of the Engineer tensile strain calculations that ensure compliance with maximum allowable strain on the pipe. If the pipe is buckled or otherwise damaged, the damaged section shall be removed and replaced by the Contractor at the Contractor's expense. The Contractor shall take appropriate steps during pullback to ensure that the pipe will be installed without damage.
5. The position of the drill string shall be monitored by the Contractor with the downhole survey instruments. The Contractor shall compute the position in the X, Y and Z axis relative to ground surface from downhole survey data a minimum of once every 30 feet. Serious deviations between the design position which may affect the installation of the pipeline and are beyond the control of the Contractor to correct shall be documented and immediately brought to the attention of the Engineer for discussion and/or approval. The profile and alignment defined on the construction drawings for the bores define the minimum depth and radius of curvature. At no point in the drilled profile shall the radius of curvature of the bore be less than the minimum allowed by the manufacturer. The Contractor shall maintain and provide to the Engineer, upon request, the data generated by the downhole survey tools in a form suitable for independent calculation of the pilot hole profile.

6. The use of a separate steering system employing a ground survey grid system, such as "Tru-Tracker" or equal should be used, at the Contractor's discretion, to ensure proper monitoring of the drill string. The Contractor may use a walkover system in lieu of a ground survey grid system if sufficient accuracies to execute this project can be maintained.
7. Boring pits shall be shored with sheeting or such other materials as required. Sheeting shall be driven to a sufficient depth below the invert of the carrier pipe to resist any pressure developed by the soil outside the boring pit. Sheeting when used shall terminate not less than 3 feet 6 inches above existing grade.
8. At the completion of the directional drilling operations, the Contractor will be required to leave all wooden sheeting in place. If steel sheeting is used, it may be removed after installation of the carrier pipe in the bore hole but prior to installation of the joining carrier pipe. However, should damage to the roadway, pipeline or any other adjacent structure occur, the Contractor shall leave all remaining sheeting in place and re-drive and leave in place any sheeting which is required to stabilize the site and prevent additional damage from occurring. The top of all sheeting left in place shall be cut off 36 inches below finished grade.
9. Bentonite or other stabilizing gels shall be used to prevent caving of the unsupported bore hole.
10. After completion of the directional drilling work, the entry and exit pit locations shall be restored to original conditions with all disturbed areas being replaced with sod as specified in Section 02930. The Contractor shall comply with all permit provisions.

#### B LOCATION AND PROTECTION OF UNDERGROUND UTILITIES

1. Correct location of all underground utilities that may impact the HDD installation is the responsibility of the Contractor, regardless of any locations shown on the drawings or previous surveys completed.
2. Utility location and notification services shall be contacted by the Contractor prior to the start of construction.
3. All existing lines and underground utilities shall be positively identified, including exposing those facilities that are located within an envelope of possible impact of HDD installation as determined for the project specific site conditions. It is the Contractor and HDD system operator's responsibility to determine this envelope of safe offset from existing utilities. This will include, but is not limited to, FDEP minimum water line separation requirements, soil conditions and layering, utility proximity and material, HDD system and equipment, and foreign subsurface material.

#### C SITE LOCATION PREPARATION

1. Work site as indicated on drawings shall be graded or filled to provide a level working area. No alterations beyond what is required for operations are to be

made

2. Contractor shall confine all activities to designated work areas.

**D DRILLING LAYOUT AND TOLERANCES**

1. The drill path shall be accurately surveyed with entry and exit areas placed in the appropriate locations within the areas indicated on drawings. If using a magnetic guidance system, drill path will be surveyed for any surface geomagnetic variations or anomalies.
2. Instrumentation shall be provided and maintained at all times that accurately locates the pilot hole, measures drill-string axial and torsional loads and measures drilling fluid discharge rate and pressure.
3. Entry and exit areas shall be drilled so as not to exceed the bending limitations of the pipe as recommended by the pipe supplier.
4. Lateral positioning at exit shall be no further than 5 feet left or right of planned centerline, and horizontal positioning shall be no further than 5 feet short or long of proposed exit location. Entry and exit locations, as well as intermediate centerline stationing, shall be staked by the Contractor.

**E PILOT HOLE BORE**

1. Pilot hole shall be drilled along bore path. In the event that the pilot bore does deviate from the bore path, it may require contractor to pull-back and re-drill from the location along bore path before the deviation.
2. The Contractor shall limit curvature in any direction to reduce force on the pipe during pull-back. The minimum radius of curvature shall be no less than that specified by the pipe supplier and as indicated on the drawings.

**F REAMING**

1. After successfully completing the pilot hole, the bore hole shall be reamed to a diameter which meets the requirements of the pipe being installed. The following table is offered as an estimated guide:

<b>Nominal Pipe Diameter</b>	<b>Bore Hole Diameter</b>
< 8 inches	Pipe Dia. + 4 inches
8 inches to 24 inches	Pipe Dia. X 1.5
> 24 inches	Pipe Dia. + 12 inches

2. Multiple reaming passes shall be used at the discretion of the Contractor and shall conform to this specification.
3. In the event of a drilling fluid fracture, returns loss or other loss of drilling fluid, the Contractor shall be responsible for restoring any damaged property to original condition and cleaning up the area in the vicinity of the damage or

loss.

### 3.05 PIPE PULL-BACK AND INSERTION

- A Pipe shall be fused prior to insertion, if the site and conditions allow, into one continuous length.
- B Contractor shall handle the pipe in a manner that will not over-stress the pipe prior to insertion. Vertical and horizontal curves shall be limited so that the pipe does not bend past the pipe supplier's minimum allowable bend radius, buckle, or otherwise become damaged. Damaged portions of the pipe shall be removed and replaced.
- C The pipe entry area shall be graded as needed to provide support for the pipe and to allow free movement into the bore hole.
  - 1. The pipe shall be guided into the bore hole to avoid deformation of, or damage to, the pipe.
  - 2. The fusible polyvinyl chloride (PVC) pipe may be continuously or partially supported on rollers or other Owner and Engineer approved friction decreasing implement during joining and insertion, as long as the pipe is not over-stressed or critically abraded prior to, or during installation.
  - 3. A swivel shall be used between the reaming head and the fusible polyvinyl chloride (PVC) pipe to minimize torsion stress on the pipe assembly.
- D Buoyancy modification shall be at the sole discretion of the Contractor, and shall not exceed the pipe supplier's guidelines in regards to maximum pull force or minimum bend radius of the pipe. Damage caused by buoyancy modifications shall be the responsibility of the Contractor.
- E Once pull-back operations have commenced, the operation shall continue without interruption until the pipe is completely pulled through the bore hole.
- F The pipe shall be installed in a manner that does not cause upheaval, settlement, cracking, or movement and distortion of surface features. Any damages caused by the Contractor's operations shall be corrected by the Contractor.
- G Pneumatic hammer shall not be used to dislodge a stuck pipe.
- H After the pipe is in place, cleaning pigs shall be used to remove residual water and debris. After the cleaning operation, the Contractor shall provide and run a sizing pig to check for anomalies in the form of buckles, dents, excessive out-of-roundness, and any other deformations. The sizing pig run shall be considered acceptable if the survey results indicate that there are no sharp anomalies (e.g. dents, buckles, gouges, and internal obstructions) greater than 2 percent of the nominal pipe diameter, or excessive ovality greater than 5 percent of the nominal pipe diameter. For gauging purposes, dent locations are those defined above which occur within a span of five feet or less. Pipe ovality shall be measured as the percent difference between the maximum and minimum pipe diameters. For gauging purposes, ovality locations are those defined above which exceed a span of five feet.

### 3.06 INSTALLATION CLEANUP

- A Following the installation, the project site shall be returned to a condition as required in the construction documents. All excavations will be backfilled and compacted per the construction documents and jurisdictional standards. All pavement and hardscape shall be repaired per applicable jurisdictional standards. All drilling fluid shall be properly disposed of per these specifications and all applicable jurisdictional laws.
- B Contractor shall verify that all utilities, structures, and surface features in the immediate project area are sound.

### 3.07 PREPARATION PRIOR TO MAKING CONNECTIONS INTO EXISTING PIPING SYSTEMS

- A Prior to making connections into existing piping systems, the contractor shall:
  1. Field verify location, size, piping material, and piping system of the existing pipe.
  2. Obtain all required fittings, which may include saddles, sleeve type couplings, flanges, mechanical restraints, tees, or others as shown in the construction documents.
  3. Have installed all temporary pumps and/or pipes in accordance with established connection plans.
- B Unless otherwise approved, new piping systems shall be completely assembled and successfully tested prior to making connections into existing pipe systems.

### 3.08 PIPE SYSTEM CONNECTIONS

- A Pipe connections shall be installed per applicable standards and regulations, as well as per the connection manufacturer's guidelines and as indicated in the construction documents. Pipe connections to structures shall be installed per applicable standards and regulations, as well as per the connection manufacturer's guidelines.
- B If possible, pipe installed via HDD shall be filled with water prior to making any connections to the existing system or other portions of the project.

### 3.09 TAPPING FOR POTABLE AND NON-POTABLE PRESSURE WATER APPLICATIONS

- A Tapping shall be performed using standard tapping saddles designed for use on PVC piping in accordance with AWWA C605. Tapping shall be performed only with use of tap saddles or sleeves. **NO DIRECT TAPPING WILL BE PERMITTED.** Tapping shall be performed in accordance with the applicable sections for Saddle Tapping per UNI-PUB-08, "PVC Pressure Pipe Tapping Guide".
- B All connections requiring a larger diameter than that recommended by the pipe supplier, shall be made with a pipe connection as specified and indicated on the

drawings.

- C Equipment used for tapping shall be made specifically for tapping PVC pipe:
  - 1. Tapping bits shall be slotted “shell” style cutters, specifically made for PVC pipe. ‘Hole saws’ and drill bits made for cutting wood, steel, ductile iron, or other materials are strictly prohibited.
  - 2. Manually operated or power operated drilling machines may be used.
- D Taps may be performed while the pipeline is filled with water and under pressure (‘wet’ tap,) or when the pipeline is not filled with water and not under pressure (‘dry’ tap).

### 3.10 TESTING

- A Testing shall comply with all applicable jurisdictional building codes, statutes, standards, regulations, and laws.
- B HYDROSTATIC TESTING AND LEAKAGE TESTING FOR FUSIBLE POLYVINYL CHLORIDE (PVC) PRESSURE PIPING
  - 1. Hydrostatic and leakage testing shall be conducted in accordance with the requirements of AWWA C605.
  - 2. Unless agreed to or otherwise designated by the owner or engineer, for a simultaneous hydrostatic and leakage test following installation, a pressure equal to 150% of working pressure at point of test, but not less than 125% of normal working pressure at highest elevation shall be applied. Unless otherwise agreed to, the duration of the pressure test shall be for two (2) hours.
  - 3. If hydrostatic testing and leakage testing are performed at separate times, follow procedures as outlined in AWWA C605.
  - 4. In preparation for pressure testing the following parameters must be followed:
    - 1) All air must be vented from the pipeline prior to pressurization. This may be accomplished with the use of the air relief valves or corporation stop valves, vent piping in the testing hardware or end caps, or any other method which adequately allows air to escape the pipeline at all high points. Venting may also be accomplished by ‘flushing’ the pipeline in accordance with the parameters and procedures as described in AWWA C605.
    - 2) The pipeline must be fully restrained prior to pressurization. This includes complete installation of all mechanical restraints per the restraint manufacturer’s guidelines, whether permanent or temporary to the final installation. This also includes the installation and curing of all required thrust blocking. All appurtenances included in the pressure test, including valves, blow-offs, and air-relief valves shall be checked for proper installation and restraint prior to beginning the test.

- 3) Temporary pipeline alignments that are being tested, such as those that are partially installed in their permanent location shall be configured to provide for the removal of trapped air in the pipeline.

C LEAKAGE TESTING FOR NON-PRESSURE FUSIBLE POLYVINYL CHLORIDE (PVC) PIPING

1. Gravity sanitary sewers that contain mechanical jointing in addition to fused PVC joints may need to be tested for excessive leakage.
2. Gravity sanitary sewer leakage testing may include appropriate water or low-pressure air testing. The leakage outward or inward (exfiltration or infiltration) shall not exceed 25 gallons per inch of pipe diameter per mile per day for any section of the system. An exfiltration or infiltration test shall be performed with a minimum positive head of two feet. The air test, if used, shall be conducted in accordance with one of the following Standards:
  - 1) ASTM F1417
  - 2) UNI-B-6
3. The testing method selected shall properly consider the existing groundwater elevations during the test.

D DEFLECTION TESTING FOR NON-PRESSURE PIPING

1. After completion of the backfill, the engineer or owner may require that a deflection test be performed.
2. Deflection tests can be conducted using a go/no-go mandrel. The mandrel's outside dimension shall be sized to permit passage through no more than 7.5 percent deflection. The percent deflection shall be established from the base inside diameter of the pipe. When the internal fusion beads are not removed, the base inside diameter shall include the height of the internal bead. The mandrel shall be approved by the owner or engineer prior to use. Other deflection test options, such as direct measurements, can be used for lines large enough for safe entry.

E INTERMEDIATE TESTING

1. Segments of the pipe may be tested separately in accordance with standard testing procedure, as approved by the owner and engineer. Testing of each HDD installation prior to connection to the system or other piping is preferred.

3.11 DISINFECTION OF POTABLE WATER PIPING

Chlorine granules shall not be used or present near the pipe ends while the pipe sections are being joined. After installation, the pipeline, having passed all required testing, shall be disinfected prior to being put into service. Unless otherwise directed by the owner or engineer, the pipeline will be disinfected per AWWA C651.

3.12 COMPLETION OF DIRECTIONAL DRILLING

- A Completion and successful testing of the approved plan will entitle the Contractor to full payment of the applicable amounts in the Contract.
- B In the event of failure to install the directional drilled pipelines, the Contractor shall retain possession of any Contractor-supplied pipe and remove it from the site. The bore holes shall be completely filled with grout to prevent future problems. If the pipe cannot be removed from the bore hole, it shall be cut off 5 feet below ground and the pipe and annular space shall be grouted.

**\*\*END OF SECTION\*\***

## SECTION 02665

### WATER DISTRIBUTION SYSTEMS

#### PART 1 - GENERAL

##### 1.1 SCOPE OF WORK

Work under this section consists of furnishing all materials, supplies, equipment and labor in accordance with the requirements set forth herein and as shown on the drawings. All work shall be performed and tested in accordance with applicable AWWA standards and manufacturer's recommendations.

##### 1.2 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

The work under this contract shall be in strict accordance with the following codes and standards:

- Local, county and municipal codes;
- American Society for Testing and Materials (ASTM);
- American National Standards Institute;
- American Water Works Association (AWWA);
- American Association of State Highway and Transportation Officials (AASHTO);
- Florida Department of Environmental Protection (FDEP)
- Florida Department of Transportation Specifications (DOT);
- Federal Specifications;
- United States Department of Commerce Commercial Standards (CS); and
- All local government rules and regulations.

The latest revision of referenced codes and standards in effect at the time of submittal of the Bid Proposal shall govern.

##### 1.3 CONTRACTOR LICENSE

Contractor and Subcontractor shall possess valid licenses required by state and local codes. All water main work shall be performed by a State of Florida licensed Underground Utility Contractor. All plumbing work on private property shall be performed by a licensed plumber.

##### 1.4 SHOP DRAWINGS AND SUBMITTALS

A. Shop drawings shall be submitted for items included under this Section and shall include the following minimum information:

- Full details of pipe, fittings, special joints, and assembly thereof, including manufacturer's name;
- Joint materials and details;
- Catalogue cuts, dimensions and full details of all castings, valves and appurtenances;
- Certifications as specified herein; and
- Reinforcing steel bending and setting drawings.

B. Furnish sworn certificates in duplicate that all tests and inspections required by the Specifications under which the materials were manufactured have been satisfied.

## 1.5 RELATED WORK

- Testing
- Earthwork
- Boring and jacking

## 1.6 INSPECTION

All pipe and fittings to be installed under this Contract may be inspected at the site of manufacture for compliance with these Specifications by an independent laboratory selected by the Owner. The manufacturer's cooperation shall be required in these inspections. The cost of inspection by an independent laboratory will be borne by the Owner.

## 1.7 MANUFACTURER TESTING OF PIPE AND FITTINGS

Each joint of pipe 6 inches in diameter and larger shall be hydrostatically tested at the point of manufacture as required by the appropriate AWWA Standard. Owner may request that certificates of compliance be furnished with the material.

All ductile and cast iron fittings to be furnished under this Contract shall be inspected and tested at the foundry as required by the AWWA Standard C-110, Section 10-10.

Provide letters of certification of all tests.

## 1.8 MEASUREMENT AND PAYMENT

### A. GENERAL

Payment for items covered in this section shall be in accordance with the Bid Proposal. When quantities are listed in the Bid Proposal, the quantities shall be determined in the following manner. However, if items are not specifically listed in the Bid Proposal, such items are considered to be included in the unit price of the item of which they are associated.

### B. WATER MAIN PIPING

1. MEASUREMENT - The length of water mains to be measured for payment will be the laying length in linear feet, actually installed, measured along the horizontal projection of the centerline of the completed pipe with no deductions made for those spaces occupied by valves or fittings.

2. PAYMENT - The unit prices as set forth in the Bid Form shall constitute full compensation for the size and type of material, for all excavation, backfilling, dewatering, furnishing, laying, jointing, all required connections between existing and new pipes, testing and disinfecting, all grassing work and complete restoration of all areas disturbed by the Contractor's operation. Pipe which has not been properly laid, bedded, jointed or backfilled shall not be included for payment. Payment for all fittings, gaskets, metallic tracer tape, concrete thrust blocks and anchors, as detailed on the Drawings and specified herein shall be included in the unit price per foot of pipe.

### C. VALVE AND BOX

1. MEASUREMENT - Measurement for payment of valve and box as specified and shown on the Drawings, will be the number of units actually furnished and installed.

2. PAYMENT - Payment will be made for each box and valve of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be in addition to the unit price paid for water mains.

D. **CONNECTING NEW WATER LINES TO EXISTING WATER LINES**

1. MEASUREMENT - Each connection of a new water line to an existing water line will be measured for payment as one unit and according to size.

2. PAYMENT - Payment for each connection of new water main to existing water main will be made at the unit price set forth in the Bid Form, and shall be full compensation for the item of work, complete, including location of existing water lines, all required excavation and backfilling, furnishing and installing all tees, gate valves, fittings, tapping sleeves, tapping valves, valve boxes, furnishing and placing all concrete supports, furnishing all labor, materials, tools, equipment; and all incidental and related work required.

E. **HIGHWAY AND RAILROAD CROSSINGS**

1. MEASUREMENT - The length of highway or railroad crossing to be measured for payment will be the actual length of steel casing pipe installed at each location shown, except that no measurement will be allowed for lengths that exceed the distances shown on the plans without prior written approval of the Engineer.

2. PAYMENT - Payment for jacking and boring highway or railroad crossings will be at the unit price per linear foot inserted in the Bid Form for the size of casing pipes and type of materials used regardless of depth. Unit price will constitute compensation in full for all labor, materials, equipment, dewatering, excavating, backfilling, casing pipe, inserting carrier pipe into casing, skids, bands, fittings and supplies required for each installation, and all grassing work. Carrier pipe will be included for payment under other items.

F. **PAVEMENT REPLACEMENT**

1. MEASUREMENT - Measurement for payment of pavement removed and later replaced shall be the lineal footage cut measured on the horizontal plane, along the centerline of the piping installed. Measurement shall be from edge to edge of pavement cut. Only that pavement located directly over the centerline of the piping being installed, will be considered eligible for payment unless otherwise shown on the Drawings or authorized by the Engineer. There shall be no duplication of measurement; e.g., pavement replacement measured for payment along a pipeline cannot be again measured for payment along a pipeline cannot be again measured for payment along an intersecting pipeline.

2. PAYMENT - Payment for pavement removed and later replaced, measured as defined above, shall be at the respective unit prices per linear foot set forth in the Bid Form. The respective unit prices shall be payment in full for the item including, but not limited to, all compaction required, materials as specified and shown on the Drawings, joint fabrication, all as applicable.

**PART 2 - MATERIALS AND EQUIPMENT**

**2.1 GENERAL**

Unless otherwise specified or shown on the drawings, materials and equipment shall be the standard product of a manufacturer and shall comply with the Contract Documents and applicable standards for such materials or equipment.

**2.2 NON-TOXIC PAINTS PROPOSED FOR CONTACT WITH DRINKING WATER**

Coatings and the chemicals that are contained in coatings to a surface in contact with drinking water, or are otherwise on equipment surfaces that come into contact with the water shall be certified as being in conformance with American National Standards Institute (ANSI) and NSF International (previously known as the National Sanitation Foundation) Standard 60-1988 by an entity certified by ANSI.

## 2.3 WATER SYSTEM COMPONENTS IN CONTACT WITH DRINKING WATER

Water system components which come into contact with drinking water shall conform with ANSI/NSF Standard 61, Drinking Water System Components.

## 2.4 DUCTILE IRON PIPE AND FITTINGS

A. Ductile iron pipe shall conform to the requirements of AWWA C151 unless otherwise noted on the plans. The pipe thickness shall be in accordance with the requirements of AWWA C151 Pressure Class 200 psi or higher. For above ground installations, threaded flanged pipe shall be supplied in accordance with AWWA C115. Glands for mechanical joints shall be ductile iron or cast iron. Pipe shall be as manufactured by American Ductile Iron Pipe Co., Clow or equal.

B. Fittings shall conform to the requirements of AWWA C110 or C153. Fittings shall be mechanical joint, or flanged as noted on the plans, and shall have a 250 psi minimum working pressure. Fittings shall be as manufactured by U.S. Pipe Co., American Ductile Iron Pipe Co., Clow or equal.

C. Flanged fittings shall conform to ANSI B16.1, screwed-on flanges, faced and drilled to ANSI Class 125-pound template. They shall provide 1/16-inch full face gaskets of red sheet rubber.

D. Joints shall conform to the requirements of AWWA C111.

E. Coatings and Linings of the internal surfaces of all ductile iron pipe and fittings for water mains shall be coated with a cement lining and seal coat in accordance with AWWA C104. The outside surface shall be coated with a bituminous coating approximately one mil thick.

F. All pipe shall be given a factory hydrostatic test of not less than 500 psi.

## 2.5 POLYVINYL CHLORIDE PIPE (PVC) AND FITTINGS

A. PVC pipe for potable water in sizes 4 inch through 12-inch shall conform to AWWA Standard C900-97, "PVC Pressure Pipe for Water", or AWWA Standard C909-02, "Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe for Water". Laying lengths shall be 20 feet  $\pm$  1 inch for all sizes.

B. Pipe shall have an integral bell end or extruded coupling with gasket seal which is in compliance with the requirements of ASTM D3139, "Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals".

C. Pipe shall be **Pressure Class 235 psi (DR 18)** with cast iron outside dimensions. Each piece of pipe shall be hydrostatically tested to 600 psi. Marking shall include nominal size and O.D. Base (e.g. 6 inch C.I.), material code designation number (PVC 1120), dimension ratio number (DR 18), AWWA pressure Class 150, AWWA designation AWWA C900 or C909, as manufacturer's name and production code. All PVC pipe shall be Underwriters Laboratory (UL) and Factory Mutual approved. All water mains shall be blue in color, and the color shall be the same through the wall of the pipe (i.e., not a surface paint or coating).

D. PVC pipe in sizes under 4 inches shall be 200 psi (SDR 21) in IPS dimensions manufactured from 1120 PVC resin. Pipe shall have integral wall bells or extruded couplings with gasket seals. Pipe shall be marked with manufacturer's name, size, material code (PVC 1120), pressure rating (200 psi), DR number (DR21).

E. All taps on PVC pipe will be made through saddles or tapping sleeve and valve.

F. Fittings for pipe smaller than 4 inches in diameter shall be PVC. Fittings for pipe 4 inches and larger shall be Ductile Iron conforming with the requirements of ANSI/AWWA C153/21.53-84.

## 2.6 WATER SERVICE PIPING

Polyethylene potable water service tubing shall conform to AWWA Standard C901, with dimensions and tolerances that conform to the values set forth in ASTM D2666. Copper tubing size outside diameter with standard dimension ratio 9 (SDR-9). Polyethylene raw material is defined by ASTM D2581, Type II, Grade I (PB2110). Working pressure shall be 250 psi at 73.4 degrees F. Tubing shall be blue in color and imprinted with size, manufacturer's name, working pressure, NSF potable water approval, ASTM specification number, and production code.

An affidavit of compliance will be required for all PB service tubing installed. Manufacturer will sign, seal and certify that all materials delivered shall comply with the requirements of AWWA C901, this Specification, and all standards of the manufacturer.

## 2.7 HDPE (HIGH DENSITY POLYETHYLENE)

High Density Polyethylene (HDPE) water pressure pipes shall be PE 4710 DR 17 and shall be seamed together using the standardization of butt-fusion procedure. HDPE shall be installed via open trench and Directional bore methods. The connecting of HDPE Pipe to other material should be in accordance with Chapter 9 of PPI's Handbook\* of Polyethylene Pipe, 2nd ed. and PPI TN-36, General Guidelines for Connecting 10 HDPE Potable Water Pressure Pipes to DI and PVC Piping Systems

***HDPE must meet AWWA C901-08 Specification for DR 17 pipe.***

SUBMITTALS: Material list naming each product to be used identified by manufacturer and type number, in accordance with Section 01340.

PRODUCT HANDLING: Handle pipe and fittings to insure delivery in a sound undamaged condition.

JOB CONDITIONS: Do not lay pipe when trenches or weather conditions are not suitable for such work.

## 2.8 DETECTABLE BURIED WARNING TAPE AND COPPER LOCATION WIRE

Detectable buried pipe warning tape shall be 2 inches minimum width, long lasting plastic with metalized foil core specifically designed for non-metallic pipes and shall be placed over all PVC water lines and fittings. Metalized core shall be detectable to depths of up to 6 feet by use of commercially available pipe location equipment. Tape shall be furnished in manufacturer's standard color and roll length and shall be imprinted continuously with the following words unless otherwise approved: CAUTION BURIED WATER MAIN BELOW. Detectable buried warning tape shall be equal to or better than Terra Tape "D", as manufactured by Griffolyn Company Inc., 10020 Mykawa Road, Post Office Box 33248, Texas, 77033

In addition to the installation of the detectable buried warning tape over all PVC water lines, the Contractor shall install a 14 gauge insulated copper wire directly on top of all PVC water lines and taped every ten feet for location purposes. The wire shall be continuous and all connections taped. Three feet of excess wire shall be left in all valve boxes. Each fire hydrant shall have one wrap of the wire around the barrel located at final grade and connected to the wire on the water main. No additional payment will be made for this wire and tape installation and will be included in the unit price per linear foot for PVC water pipe.

## 2.9 VALVES AND GATES

### A. General

1. Unless otherwise indicated, valves three (3) inches and smaller shall be all brass or bronze, and valves larger

than three (3) inches shall be iron body, bronze mounted. Unless otherwise indicated, gate, globe, angle, and check valves three (3) inches and smaller shall be provided with threaded connections; those larger than three (3) inches shall be provided with connections as indicated. Connections shall conform to the herein above specified piping connections.

2. All valves shall be ample strength to withstand and operate satisfactorily under the working pressures and shall be subject to the test pressure specified herein. All valves shall be rated for a minimum cold water working pressure of 150 psi and a minimum test pressure of 300 psi, except as otherwise specified herein.

3. Tests shall be made in the shop with a hydrostatic water pressure, cost of tests to be merged in the cost of the valves, and any valves which leak or which show any defects shall be rejected.

#### **B. Gate Valves 4" and Larger (Resilient Wedge)**

1. All valves in size four inch through 12 inch shall be of the resilient wedge gate type. Valves shall be manufactured to meet all applicable requirements of AWWA Standards for Resilient Seated Gate Valves, C509 or C515. All valves of this type shall be bubble tight at 200 psi water pressure.

2. Valves shall have non-rising stems open by turning counter clockwise (left) and with two inch square operating nut with arrow cast in metal to indicate direction of opening.

3. The inside of the valve body and bonnet shall be lined with an epoxy coating. The lining shall be a two-part thermosetting epoxy resin applied by the manufacturer and equal to Endurall 3300.

4. Each valve shall have the manufacturer's name, pressure rating and year manufactured cast on the body. Prior to shipment from the factory, each valve shall be tested by hydrostatic pressure equal to twice the specified working pressure.

5. All valves shall be the mechanical joint type as manufactured by Mueller, Clow, American, Dresser or equal.

6. Each valve shall be equipped with a valve box. For this project a total of two (2) tee handle socket valve wrenches shall be furnished by the Contractor to the Owner. The cost of valve wrenches and boxes shall be included in the price of the valve.

#### **C. Gate Valves, Under 4 inches (Bronze)**

Gate valves three (3) inches in size and smaller shall be 125 lb. bronze, rising stem, double wedge disc, union or screwed bonnet type. Valves shall be of a design to permit repacking under pressure. Unless otherwise indicated valves shall be equipped with handwheels. Each valve shall be equipped with a valve box.

### **2.10 VALVE BOXES**

All valves installed underground shall be provided with adjustable cast iron valve boxes to fit the depth of earth cover over the valve. Boxes shall be three piece adjustable screw type with a minimum inside diameter of 5". Boxes shall be furnished with case iron covers marked "Water" and so constructed as to be tight and non-rattling. Boxes shall be so designed as not to bear on the valve or pipeline or transmit any surface loads thereto.

### **2.11 FIRE HYDRANTS**

All fire hydrants shall fully comply with AWWA C-502 and be a mechanical-joint, dry barrel-traffic type as manufactured by American AVK High Pressure, 250 PSI, Nostalgic type or approved equal. The upper and lower stem along with all

hardware shall be stainless steel. The size shall be six (6) inches in diameter by three (3) feet in length with 5-1/4 inch main valve opening, a 1-1/2 inch Pentagon operating nut and equipped with two 2-1/2 inch hoses and one 4-1/2 inch pumper connections. The hydrant shall be painted fire engine red with caps equipped with chains.

**2.12 FLUSHING HYDRANTS**

All flushing hydrants shall be hidden type dry barrel design with 3-ft. bury depth, shut-off valve and 2-1/2" hose nozzle as manufactured by Mueller No. A-410 or equal. Contractor shall provide and install necessary fittings to transition from water main to 2" pipe thread connection. Shut-off valve shall be provided with integral drain to allow hydrant post to drain after use to prevent freeze damage.

**2.13 HOSE BIBS**

Hose bibs shall be Crane No. 58 or equal of size shown on the Drawings.

**2.14 CORPORATION STOPS AND CURB STOPS**

All corporation stops and curb stops shall be maintained and dimensioned in accordance with AWWA Standard C800. All compression fittings shall be designed for use with copper tubing size (CTS) service lines. Stainless steel insert stiffeners will be required when polybutylene tubing is used. "Ball type or Oriseal" valves shall be used in all sizes. Either Ford (pack joint), A. Y. McDonald (T-series), or Mueller (110 series) is approved for use. No substitutes.

All corporation stops and curb stops will conform to the inlet and outlet configuration as listed below:

CORPORATION STOPS				
SIZE	3/4"	1"	1½"	2"
INLET	cc thread	cc thread	IP thread	IP thread
OUTLET	compression	compression	compression	compression

CURB STOPS				
SIZE	3/4"	1"	1½"	2"
INLET	compression	compression	compression	compression
OUTLET	female IP thread	female IP thread	female IP thread	female IP thread

**2.15 SERVICE SADDLES**

For 3/4 inch and 1 inch taps on PVC pipe, a service saddle with a single 2 inch wide stainless steel band or strap shall be furnished. The saddle shall be of cast or ductile iron and shall be epoxy, nylon, or PE coated (10 mils minimum). Approved styles are Ford FC101, Romac 101N and Rockwell 315, or Cascade Model CNS1. No substitutes.

For 1 1/2 inch and 2 inch taps on PVC pipe, a more stable saddle is required. Saddles for these taps shall have either two each stainless steel 2 inch straps or a single stainless strap a minimum of 3 1/4 inches wide. The saddle body shall be cast or ductile iron and shall be coated with epoxy or nylon. Approved styles are Ford FC202, Romac 202N and Rockwell 317, Cascade Model CNS2.

As an equal alternate, service saddles may be Continental "Fasttap" model #5263-31-2506-00.

## **2.16 REPAIR OR JOINING CLAMPS**

If repair or joining clamps are required, Contractor shall notify Engineer for approval indicating make and model and intend use. Clamps shall be of non-corrosive material (i.e., stainless steel, cast iron, bronze) as manufactured by Rockwell or equal.

## **2.17 TAPPING SADDLES, SLEEVES AND CROSSES**

### **A. Tapping Saddles**

Tapping saddles shall be fabricated of ductile iron or steel and suitable for either wet or dry installation as manufactured by American Cast Iron Pipe Company, U.C. M. Corporation, or approved equal. The sealing gasket shall be the o-ring type suitable for the applicable service. The outlet flange shall be ANSI B16.1, 125 lb. standard.

The straps and bolts shall be a corrosion resistant alloy steel.

### **B. Tapping Sleeves and Crosses**

Tapping sleeves and crosses shall be of mechanical joint type with outlet flange per ANSE B16.1, 125 lb. standard as manufactured by Mueller No. 615 or 715, or approved equal.

### **C. Cut-In Sleeves**

Cut-In sleeves shall be mechanical joint type class 150 ductile iron as manufactured by Mueller.

## **2.18 METER BOXES**

Meter boxes shall be concrete, plastic, or cast iron unless otherwise indicated on the plans or in the Bid Proposal. The inside dimensions shall be approximately 11" x 24", rectangular in shape with a hinged cast iron lid for reading the meter. The box shall be large enough to house the back flow preventor, meter, curb stop, and hand valve.

## **2.19 DOMESTIC WATER METER (NOT APPLICABLE)**

### **A. General**

**\*\*ENGINEER SELECT ONE OF THE FOLLOWING\*\***

All water meters shall be sized as indicated on the plans and shall be Schlumberger Industries model T-10, or approved equal, with programmable oil-filled encoder register (mfr. Rep.: SEMSCO, 407-831-3516). No batteries shall be required in either register or receptacle pad. A mini-pit receptacle shall be supplied for each meter and shall be installed in meter box lid by contractor, such that reading can be accomplished without removing meter box lid. Two meter reading long Advantage Wands shall be provided with Ni-Cad batteries and battery charger. All software, hardware and technical instruction/support (one year) shall be provided as required to allow the meter reading system to be set up and operated and data to be downloaded to an IBM compatible computer at no additional cost to the Owner.

Alternate Design:

The domestic meter shall be a positive displacement, 5/8 inch by ¾ inch size unless otherwise indicated on drawings. It shall meet AWWA standards for displacement type cold water meters. The water meter shall be a Rockwell SR or approved equal.

## **B. Meter Construction**

### **1. Main Case**

The meter shall have a bronze main case. The bronze case must be able to withstand internal pressure and external stress without distortion, cracking or breaking to cause leaking or to interfere with the proper operation of the meter. The meter shall have a strainer to prevent foreign material from entering the measuring chamber.

### **2. Register**

The register shall be hermetically sealed and magnetically driven. The registration reading shall be U.S. gallons with a 10 gallon sweepband and shall have a capacity of 1,000,000 gallons.

### **3. Accuracy and Operating Range**

Normal operating flow range of the meter shall be 1 to 20 gallons per minute and accuracy at the normal flow range shall be  $100 \pm 1.5$  percent of actual flow. Low flow registration shall be 95 percent at 1/4 gallons per minute. Maximum pressure loss at 20 gallons per minute shall not exceed 11 psi. Maximum operating pressure shall be 140 psi.

## **C. Workmanship and Materials**

**\*\*ENGINEER SELECT ONE OF THE FOLLOWING\*\***

The supplier and manufacturer shall warrant the register for 10 years, the meter case for the life of the meter, and the new meter accuracy for 5 years. The supplier shall replace or repair, without charge, those parts in which a defect has developed within the specified warranty period upon return of such parts.

The meter installation shall be warranted for a period of twelve (12) months.

Alternate Design:

The supplier and manufacturer shall warrant the meter including register for a period of twenty five (25) years. The supplier shall replace or repair, without charge, those parts in which a defect has developed within the specified warranty period upon return of such parts.

### **2.20 GLOBE SERVICE VALVES (HAND VALVE)**

Globe service valves (hand valves) shall be installed inside meter box. Valves shall be 3/4" size with 3/4" iron pipe threads end configuration. Globe service valves shall be Ford G11-333 or approved equal.

### **2.21 ANGLE BALL METER VALVES**

Angle ball meter valves shall be 5/8" size with inlet pack joint for 3/4" plastic tubing. Angle ball meter valves shall be Ford BA43-232W or approved equal.

### **2.22 RESIDENTIAL BACKFLOW PREVENTER**

Residential backflow preventers shall be Mueller RPZ Model H-14242 or approved equal.

## PART 3 - EXECUTION

### 3.1 GENERAL REQUIREMENTS

#### A. Safety

In the Contractor's use of streets and highway for the work to be done under these Specifications he shall conform to all City, State, and local laws and regulations. The Contractor shall provide, erect, and maintain effective barricades, danger signals, and signs on all intercepted streets or highways for protection of the work and safety of the public rights-of-ways shall be provided with lights which shall be kept burning at all times between sunset and sunrise. The Contractor shall be responsible for all damages resulting from any neglect or failure to meet these requirements. Where conditions require the presence of a watchman to fulfill the requirements stated herein, same shall be furnished without extra cost to the Owner.

#### B. Maintenance of Service

The Contractor shall arrange his work to cause minimum disturbance of normal pedestrian and vehicular traffic and will be held responsible for providing suitable means of access to all public and private properties during all stages of the construction. Should the construction work require repairs, changes or modifications of other utilities, it shall be the responsibility of the Contractor to provide for the maintenance of continuous water, electric, telephone, and gas as well as sewage and other utility services to all present customers of such utilities, unless approval in writing is secured from the utility company for interruption of such service. Contractor's attention is directed to section 02200 "Earthwork" for additional maintenance of service requirements.

#### C. Limits of Construction

In locations where the work is to be installed in streets or road right-of-way the activities of the Contractor shall be confined to these public properties. Where the use of private property is deemed necessary by the Contractor to facilitate construction work arrangement for such use with the property Owner shall be the responsibility of the Contractor. The Contractor shall save the Owner harmless from all claims by adjacent property owners for trespassing or damage due to the activities of the Contractor in the prosecution of the work.

#### D. Existing Utilities

The Contract Documents contain data relative to existing public utility installations and structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy and it is the responsibility of the Contractor to make his own investigations to inform himself fully of the character, condition and extent of all such installations and structures as may be encountered and as may affect the construction operations.

All existing improvements such as pavements, conduit, poles, pipes and other structures, shall be carefully supported and fully protected from injury. The Contractor shall be responsible for damages to these existing utilities and shall, in case they are damaged, restore them to their original condition at no cost to the owner.

Contractor shall give written notice to the Owner and other governmental utility departments and other owners of public utilities of the location of his proposed construction operations, at least forty-eight hours in advance of breaking ground in any area or on any unit of work. This can be accomplished by making the appropriate contact with the following utility companies listed on page

2 of the plans.

### 3.2 PIPE INSTALLATION

#### A. Connections to Existing Mains

It is the Contractor's responsibility to make exploratory excavations and/or use other methods available to locate valves, fittings and piping prior to construction of any underground piping system and to adjust the new piping layout to agree with existing piping layout prior to construction and at no additional cost to the Owner. All adjustments shall be subject to approval by the Engineer prior to installation.

Prior to any connection to existing mains, all new water mains and service lines must have passed all pressure and disinfection test as required herein and written permission must be obtained from the Engineer authorizing the connection. The Engineer's authorization shall only be given after a clearance or partial clearance is issued by the Florida Department of Environmental Protection.

Contractor shall have all fittings and equipment and adequate labor on-hand so as to make as quick as possible connection to minimize interruption of water service. Engineer shall specify time of day and day of week for connection to minimize effects of interruption. Contractor shall notify Engineer and utility owner 48 hours prior to connection. Engineer may require Contractor to use restraint rods, retainer glands or other methods in place of thrust blocks to avoid time required for concrete to harden.

#### B. Separation

Water and sewer lines shall maintain a horizontal separation of 10 feet or a vertical separation of 18 inches. When this is not possible, concrete encasement of pipe for a distance of ten feet each side of the sewer main shall be used. In lieu of the concrete encasement, ductile iron pipe may be used. A minimum vertical separation of 6 inches shall be maintained with all other utilities.

#### C. Excavation, Backfill and Compaction

Excavation, backfill and compaction shall meet the requirements of Section 02200, Earthwork and as shown on the drawings. Stones found in trenches for water mains shall be removed to a depth of at least six inches below the bottom of the pipe, and continuous and uniform bedding shall be provided. Backfill material shall be tamped in layers around pipe main to a sufficient height above the pipe to provide adequate support and protect the pipe.

#### D. Field Layout

Only approximate location of lines are indicated on drawings. Field adjustment of location will be required. Consult Engineer for proper adjustments.

#### E. Depth of Cover

Where elevations are not indicated, lay water main lines with a minimum of 36 inches of cover unless shallower depths are specifically indicated on the drawings. Greater depths will be permitted where required to miss obstructions or for proper installation of valves, hydrants, or specials. Pipe shall not be deflected more than manufacturer's recommendation.

Service lines shall have a minimum cover of 18 inches.

**F. Well Pointing**

Water shall not be allowed in the trench at any time. An adequate supply of well points, headers or pumps, all in first class operating conditions, may be used to remove the water. The use of gravel and pumps shall also be an acceptable means of removing the water. The trench shall be excavated no more than the available pumping facilities are capable of handling. This discharge from pumps shall be routed to natural drainage channels or emptied into drains or storm sewers.

**G. Ductile Iron Pipe (D.I.P.)**

Ductile iron pipe and fittings shall be installed in accordance with requirements of AWWA Standard Specification C600 and the Handbook of Ductile Iron Pipe, 6th Edition.

**H. Polyvinyl Chloride Pipe (PVC)**

PVC pipe and fittings shall be installed in accordance with the Handbook of PVC Pipe, 2nd Edition.

**I. Pipe Laying**

The bottom of the trench shall not be excavated below the specified grade. If undercutting occurs, the bottom of the trench shall be brought up to the original grade with approved material, thoroughly compacted as directed by the Engineer.

After placing a length of pipe in the trench, the spigot end shall be centered in the bell, the pipe forced home, brought to correct alignment, and covered with an approved backfill material.

When pipe laying is not in progress, the open ends of pipe shall be closed by a water tight plug or other approved means. This provision shall apply during the noon hour as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

The cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe.

Lines shall be laid reasonably straight and any change in grade following the contour of the ground shall be made in long sweeping curves and no abrupt changes in direction or grade will be allowed except as indicated on the Drawings.

**3.3 INSTALLATION OF COPPER LOCATION WIRE AND DETECTABLE WARNING TAPE**

Installation of the 14 gauge insulated copper wire and the detectable buried warning tape shall be installed by the Contractor over all PVC and plastic water mains and service lines as indicated on the Drawings and specified here, except the detectable tape is not required over service lines. Following trenching and laying of the water main line, the trench shall be backfilled and compacted as specified elsewhere to a depth of 16 inches  $\pm$  2 inches measured from ground level. Tape shall then be placed into the trench with the wording side visible and centered directly above the pipe below. Installation of the tape shall be in accordance with the manufacturer's recommendations, except as otherwise specified or approved. Tape shall run continuously. Where splicing is required, tape shall be over-lapped a minimum of 12 inches.

Following placement of the tape, the trench shall be backfilled with due caution to prevent displacement or damage

to the tape.

After the tape has been installed and the trench backfilled, the Contractor shall perform a detection test using a commercially available pipe detector furnished by the Contractor. Any undetectable tape shall be replaced by the Contractor to the satisfaction of the Engineer at no additional expense to the Owner.

### **3.4 VALVES AND FITTINGS**

All valves and fittings shall be set and joined to the pipe in the proper location as specified in the Drawings. A valve box shall be provided for every valve. This valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve, with the box cover flush with the final grade or as may be specified in the Drawings.

### **3.5 THRUST BLOCKS**

Longitudinal thrust along pressurized pipe lines at bends, tees, reducers, and caps or plugs shall be counteracted by enough weight of concrete to counterbalance the vertical and horizontal thrust forces. Where undisturbed trench walls are not available for thrust blocking, the Contractor shall furnish and install suitable pipe harnesses or ties designed and manufactured for this purpose. Harnesses and/or ties shall be approved by the Engineer.

Thrust blocks shall be sized for 150 psi hydrostatic pressure, with dimensions as indicated on the Water Detail Sheet. Restrained joints shall be used where directed by the drawings and may be used at other locations with prior approval by the Engineer. Joints shall be protected by felt roofing paper prior to placing concrete thrust block.

Concrete for thrust blocking shall be no leaner than one part cement, 1 1/2 parts sand, and 5 1/2 parts aggregate having a compressive strength of 2000 psi. Concrete shall be placed against undisturbed material, and shall not cover joints, bolts or nuts, or interfere with the removal of any joint. Wooden side forms shall be provided for thrust blocks.

In lieu of thrust blocking, with the approval of the Engineer, pipe harnesses and/or ties or restrained push-on or restrained mechanical joints may be used.

### **3.6 RESTRAINED JOINTS**

Sections of piping designated on the drawings as having restrained joints or those requiring restrained joints due to insufficient time to allow curing of concrete thrust blocks shall be constructed using pipe and fittings with restrained "locked-type" joints, retainer glands, or tie rods, and the joints shall be capable of holding against withdrawal for line pressures up to 150 pounds per square inch (psi). Tie rods, clamps, or other dissimilar metal shall be protected against corrosion by hand application of a 2.0 mils thick bituminous coat. Bolts, nuts, and tie rods shall be hot dipped galvanized, low alloy, high-strength steel. Tie rods, tie bolts, and hairpins shall have a minimum diameter of 3/4 inch, and 7000 pound tensile strength.

Contractor shall submit type and method of restrained joints to Engineer for approval prior to use.

### **3.7 SERVICE TAPS**

All tapping shall follow manufacturer's recommended procedures. Taps will be located at 10:00 or 2:00 on the circumference of the pipe. Direct taps will be allowed only on ductile iron pipe. All other materials will be tapped with a saddle. Teflon tape for sealing and lubricating will be used on the threads of all corporation stops. Torque on corporation stops will not exceed manufacturer's recommendations. Allowance for any possible movement in the main will be made by making a half loop in the service piping at the tap and compacting backfill to 100 percent standard proctor under this loop.

### 3.8 SERVICE LATERALS

Water Service laterals shall be continuous with no joints from the water main to the water meter unless specifically allowed by the Engineer. However, in no case will joints be allowed under roadways.

Laterals may be installed by the open trench method except for paved areas. Under paved areas service laterals shall be installed by the dry-uncased boring method unless otherwise specifically indicated on the plans.

The dry-uncased boring method or "push-pull" method shall be used to eliminate the need for open cutting of streets or sidewalks. The Contractor shall use equipment specifically designed for this purpose such as the Mighty Mole or the Trojan Workhorse Pusher. The push rod shall be of the size compatible with the service lateral. The rod shall be pushed under the paved area and then the pipe attached and pulled back through. The pits for the operation shall be no closer than 3 feet to the edge of payment. In no case shall a wet boring method be allowed.

### 3.9 PRESSURE AND LEAKAGE TESTS OF WATER DISTRIBUTION PIPING

Contractor shall furnish all gauges, meters, pressure pumps, equipment, fittings, and labor needed to test the line. The cost of these items shall be included in price of pipe. Contractor shall notify Engineer 48 hours prior to start of test. All pipe installed shall be tested and written acceptance issued by the Engineer prior to connection of new line to existing water system. The pressure test shall include service lines to the curb stop.

The Contractor may test the system with joints exposed or backfilling complete at his option. The contractor shall obtain and pay for all water used. Care shall be used to prevent backflow of test water into potable water source. Potable water source shall be disconnected prior to pressurizing test line. Water used during test shall be taken from a container, not directly from the existing water system.

At least 24 hours prior to the start of the pressure and leakage test, pressure shall be raised to 150 psig and held to allow any "soil creep" or other stress relaxation to occur. If any pressure reduction occurs during the 24 hour "shakedown" period, reestablish the required hydrostatic test pressure, then proceed with the leakage test.

The pressure required for the field hydrostatic pressure test shall be 150 psi. The Contractor shall provide temporary plugs and blocking necessary to maintain the required test pressure. Corporation cocks at least 3/4 inches in diameter, pipe risers and angle globe valves shall be provided at each pipe dead-end and high points in order to bleed air from the line. Duration of pressure test shall be at least two hours. All leaks evident at the surface shall be repaired and leakage eliminated regardless of total leakage as shown by test. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipes, valves and accessories shall be removed and replaced. The pipe lines shall be tested in such section as may be directed by the Engineer by shutting valves or installing temporary plugs as required. The line shall be filled with water, all air removed, and the test pressure shall be maintained in the pipe for the entire test period by means of a gasoline or electric driven test pump to be furnished by the Contractor. Accurate means shall be provided for measuring the water required to maintain this pressure. The amount of water required is a measure of the leakage.

No pipe installation will be accepted until or unless the leakage (evaluated on a pressure basis of 150 psi) is less than 2.2 gallons per 24 hours per thousand feet per inch nominal diameter. The following tabulates the allowable leakage.

Allowable Leakage Per 1000 ft of Pipeline (In Gallons)	
Nominal Pipe Diameter	
Duration of Test	

	2"	3"	4"	5"	6"	8"	10"	12"
1 hour	0.18	0.28	0.37	0.46	0.55	0.74	0.92	1.10
2 hour	0.37	0.55	0.74	0.92	1.10	1.47	1.84	2.20

Where any section of a main is provided with concrete reaction backing the hydrostatic pressure test shall not be made until at least five (5) days have elapsed after the concrete reaction backing was installed. If high early-strength cement is used in the concrete reaction backing, the hydrostatic pressure test shall not be made until at least three (3) days have elapsed.

### 3.10 FLUSHING OF COMPLETED PIPELINES

Following the hydrostatic test and backfilling, each section of completed pipeline shall be as thoroughly flushed as possible. A minimum flow shall be used for flushing that will insure a velocity in the pipe of 2.5 feet per second. Water required for testing and flushing shall be furnished by the Contractor. The water shall be from a potable water source satisfactory to the Owner.

### 3.11 DISINFECTING POTABLE WATER PIPELINES

Following flushing, the Contractor shall disinfect all water distribution mains and service lines in accordance with AWWA Specification C601-68 and with the State of Florida Health Standards. Water shall be fed slowly into the system applying sufficient chlorine to produce a dosage in excess of 50 ppm at the farthest point in the system from the point of application. The chlorine solution then shall be retained in the line for a minimum period of 24 hours. At the end of this time if a minimum chlorine residual of 5 ppm is not obtained, the procedure shall be repeated. During the disinfection process all valves shall be operated. After disinfection, the water shall be flushed from the system at its extremities until excessive chlorine residuals are eliminated. The water shall also be flushed through the service lines. The lines shall then be refilled with potable water. Bacteriological sampling and analysis of the replacement water shall be taken by the Contractor as directed by the Engineer or County Health Department and submitted to the nearest approved bacteriological laboratory. Disinfection shall not be considered satisfactory until laboratory reports are satisfactory to the Division of Health and clearance granted by F.D.E.P. Each sample point shall have two consecutive passing tests taken no less than 24 hours apart.

For water main sections less than 200 feet in length, a minimum of 2 bacteriological sample points shall be tested, one from each end of the pipe section. For water main sections greater than 200 feet in length, a minimum of 3 bacteriological sample points shall be tested, one at each end and one near the midpoint of the section of pipe. But in no case shall less than one bacteriological sample point be tested for each 300 lineal feet of pipe.

Water required for disinfection, testing and flushing shall be furnished by the Contractor. The water shall be from a potable water source satisfactory to the Owner. All cost associated with disinfecting including the cost of the water shall be included in the unit cost of the pipe and no separate payment will be made for this item.

Contractor shall not make any connection to existing water system nor place any water line in operation until all pressure and bacteriological test have been successfully completed and written authorization issued by the Engineer with clearance granted by F.D.E.P.

**NOTE:** H.T.H. should be applied at a rate of 0.7 pounds per 1000 gallons. Calcium hypochlorite tables (H.T.H.) containing 70 percent available chlorine may be used when water mains are 12 inches and smaller and lengths up to 2,500 feet. The water main shall be disinfected with a concentration of 50 PPM chlorine. The H.T.H. tablets shall be

glued with a #1 Permatex. They shall be placed one foot from the end of the top innerside of the pipe. The following table was computed with 20 feet joints of pipe.

4" pipe use 1 H.T.H. tablet or 0.5 lb. per 1000 feet of pipe  
6" pipe use 2 H.T.H. tablets or 1.0 lb. per 1000 feet of pipe  
8" pipe use 3 H.T.H. tablets or 1.8 lb. per 1000 feet of pipe  
10" pipe use 5 H.T.H. tablets or 3 lb. per 1000 feet of pipe  
12" pipe use 7 H.T.H. tablets or 4.1 lb. per 1000 feet of pipe

Tablets shall be placed in each section of pipe, fire hydrants, and hydrant branches.

### **3.12 RESTORATION OF DAMAGED SURFACES, STRUCTURES AND PROPERTY**

Where pavement, trees, shrubbery, fences or other property and surface structures not designated as pay items, have been damaged, removed or disturbed by the Contractor whether deliberately or not, such property and surface structures shall be replaced or repaired at the expense of the Contractor to a condition equal to that before work began within a timeframe approved by the Engineer.

**END OF SECTION**

**VERIFICATION OF WATERLINE  
PRESSURE AND DISINFECTION TEST**

PROJECT \_\_\_\_\_ PROJECT NO. \_\_\_\_\_  
PROJECT LOCATION \_\_\_\_\_  
ENGINEER \_\_\_\_\_ CONTRACTOR \_\_\_\_\_

DESCRIPTION/LOCATION OF WATERLINE  
SHOWN ON CONSTRUCTION PLANS SHEET(S) \_\_\_\_\_  
(INCLUDE TOTAL LINEAL FEET OF EACH PIPE SIZE AND TYPE)  
\_\_\_\_\_  
\_\_\_\_\_

SKETCH (SHOW SAMPLING POINTS)

**PRESSURE TEST**

DATE \_\_\_\_\_ PRESSURE \_\_\_\_\_ p.s.i. DURATION \_\_\_\_\_ HOURS  
ALLOWABLE LEAKAGE \_\_\_\_\_ GALLONS  
ACTUAL OBSERVED LEAKAGE \_\_\_\_\_ GALLONS

**DISINFECTION**

DATE \_\_\_\_\_ VOLUME OF WATER IN PIPE \_\_\_\_\_ GALLONS  
HTH ADDED TO WATER \_\_\_\_\_ POUNDS  
CHLORINE RESIDUAL AT END OF 24 HOURS \_\_\_\_\_ PPM

**BACTERIOLOGICAL TEST**

DATE SAMPLES TAKEN \_\_\_\_\_ NO. OF SAMPLES \_\_\_\_\_  
LABORATORY \_\_\_\_\_  
RESULTS \_\_\_\_\_

As Engineer or Engineer's representative, having verified the waterline described above has passed the pressure and disinfecting test and requirements as specified in the contract documents and clearance has been by F.D.E.P., do hereby authorize said waterline for connection to existing system and/or placement in service. However, this does not constitute final acceptance of the waterline nor acceptance of backfill or paving associated with the waterline.

\_\_\_\_\_  
SIGNATURE TITLE DATE

Attachments: F.D.E.P. Clearance letter  
Bacteriological Test Reports

## SECTION 02930

### SODDING, SEEDING AND MULCHING

#### PART 1 - GENERAL

##### 1.1 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required to prepare lawn bed and install sodding, seeding and mulching as shown on contract drawings and as specified.

B. Areas to receive sodded grass shall be:

1. Two foot wide strip along edge of all asphaltic concrete paving constructed as a part of this contract. This includes roadways and parking areas.

2. Five foot wide strip around the perimeter of all concrete structures constructed or reconstructed as a part of this contract. This includes drainage structures, slabs, and pump stations. However, sod is not required around manholes nor fences.

3. All areas indicated on the drawings. and per references on SWPPP, Sht.C8.

4. All areas in lawns disturbed by Contractor.

5. One foot wide strip along edge of all sidewalks constructed or reconstructed as a part of this contract.

C. Areas to receive seed and mulch shall be:

1. All areas disturbed by Contractor that are not required to be sodded.

2. All areas indicated on the drawings, and per references on SWPPP, Sht.C8.

##### 1.2 SUBMITTALS

Contractor shall submit to the Engineer a signed statement of total weight for each type of seed and fertilizer actually installed on the project with copies of purchase receipts.

#### PART 2 - MATERIALS

##### 2.1 MULCH

The mulch used shall be normally dry mulch and shall consist of pangola, coastal bermuda or bahia grass hay.

##### 2.2 SEED

Grass seed shall be a mixture of 20 parts of Bermuda seed, 40 parts of Argentine Bahia seed, and 40 parts of brown top millet, except that during the winter months, Rye grass seed or other approved

winter cover crop seed shall replace the millet. The three types of seed used shall be thoroughly dry-mixed immediately before sowing. Seed which has become wet or moldy shall not be used.

The Bermuda seed shall be hulled seed. The Argentine Bahia seed shall be scarified seed, having a minimum active germination of 40 percent and a total germination of 85 percent. All seed shall meet the requirements of the State Department of Agriculture and Consumer Services and all applicable State laws, and shall be approved by the Engineer before being sown.

### **2.3 FERTILIZER**

Commercial fertilizer shall comply with the State fertilizer laws.

The numeral designations for fertilizer indicate the minimum percentage (respectively) of (1) total nitrogen, (2) available phosphoric acid, and (3) water-soluble potash, contained in the fertilizer.

The chemical designation shall be 12-8-8. Either dry or liquid fertilizer may be used.

### **2.4 SOD**

Sod shall be of the same type as the surrounding areas to be restored or as otherwise indicated on the Drawings or directed by the Engineer. Sod shall meet the applicable requirements of Section 981, Grassing and Sodding Materials of the "Florida Department of Transportation Standard Specification for Road and Bridge Construction", (1986).

### **2.5 WATER**

The Water used in the grassing operations shall be free of excess and harmful chemicals, acids, alkalies, or any substance which may be harmful to plant growth or obnoxious to traffic. Saltwater shall not be used.

## **PART 3 - EXECUTION**

### **3.1 LAWN BED PREPARATION**

Areas to be seeded shall be cleared of all rough grass, weeds, and debris, and the ground brought to an even grade as approved. The soil shall then be thoroughly tilled to a minimum 8-inch depth. The areas shall then be brought to proper grade, free of sticks, stones, or other foreign matter over 1-inch in diameter or dimension. The surface shall conform to finish grade, free of water-retaining depressions, the soil friable and of uniformly firm texture.

### **3.2 SEEDING AND MULCHING**

Fertilizing, seeding or mulching operations will not be permitted when wind velocities exceed 15 miles per hour. Seed shall be planted or sown only when the soil is moist and in proper condition to induce growth.

Apply the lawn seed with a drop type spreader at the rate of eight (8) pounds per one thousand (1,000) square feet.

Apply half the seed in one direction and the remainder at right angles to the first seeding.

After applying the seed, rake the seed into the seed bed and roll with a lawn roller.

Seeded areas shall be uniformly mulched in a continuous blanket immediately following seeding

and compacting operations, using at least 1 1/2 tons of hay or straw per acre. Hay with noxious seeds or plants will not be acceptable. Rotted, brittle, molded hay will not be accepted. It is intended that mulch shall allow some sunlight to penetrate and air to circulate, at the same time shading the ground, reducing erosion and conserving soil moisture. Thickness of covering shall be adequate to hold soil but sufficiently loose and open to favor development of grass. Immediately following spreading of mulch, material shall be anchored to soil by means of a seed drill, dish harrow set to cut only slightly, or other suitable equipment which will secure mulch firmly and prevent loss or bunching by wind or rain, or may be anchored with string lines placed at sufficient intervals. On slopes where machinery cannot be used mulch may be retained in place by hand spading, string lines, or non-metallic open weave fabric. Unless rain is imminent, mulched areas shall be watered immediately after placing. Upon completion, surface or mulched areas shall be free from clods of earth, bumps, or waterholding pockets and to required grades.

### **3.3 SODDING**

Sodding shall be incorporated into the project at the earliest practical time in the life of the contract. No sod which has been cut for more than 72 hours shall be used unless specifically authorized by the Engineer after his careful inspection thereof. Any sod which is not planted within 24 hours after cutting shall be stacked in an approved manner and maintained properly moistened.

Sodding shall not be performed when weather and soil conditions are, in the Engineer's opinion, unsuitable for proper results.

The sod shall be placed on the prepared surface, with edges in close contact, and shall be firmly and smoothly embedded by light tamping with appropriate tools.

Where sodding is used in drainage ditches, the setting of the pieces shall be staggered such as to avoid a continuous seam along the line of flow. Along the edges of such staggered areas the offsets of individual strips shall not exceed six inches. In order to prevent erosion caused by vertical edges at the outer limits, the outer pieces of sod shall be tamped so as to produce a featheredge effect.

On areas where the sod may slide, due to height and slope, the Engineer may direct that the sod be pegged, with pegs driven through the sod blocks into firm earth, at suitable intervals.

Any pieces of sod which, after placing, show an appearance of extreme dryness shall be removed from the work.

### **3.4 MAINTENANCE**

Maintenance shall begin immediately following the last operation of grassing and continue until final acceptance. Maintenance shall include watering, mowing, replanting, and all other work necessary to produce a uniform stand of grass.

Sufficient watering shall be done by the Contractor to maintain adequate moisture for optimum development of the lawn areas. Grassed areas shall receive no less than 1.5 inches of water per week.

Grassing will be considered for final acceptance when the permanent grass is healthy and growing on 95 percent of the area with no bare areas wider than twelve (12) inches.

**END OF SECTION**

## SECTION 03200

### CONCRETE WORK - GENERAL

#### PART 1 - GENERAL

##### 1.1 SCOPE OF WORK

The work under this section includes all materials, equipment, and labor and performing all operations for constructing the concrete work including lightweight concrete as shown on the drawings, called for herein, or necessary for the proper completion of the work in accordance with these specifications and to the lines, notes, and dimensions indicated on the drawings or specified herein.

##### 1.2 GENERAL REQUIREMENTS

A. Whenever a standard, regulation, code, specification, or other publication is referenced herein, it shall be applicable on all matters not in conflict with these specifications as if fully set forth herein and as provided in the General or Special Conditions for referenced specifications. Except where a particular edition is called for, such referenced publications shall be the latest edition on the date of the Contract Documents and abbreviations used in the titles thereof are as follows:

1. ASTM: American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103.

2. ACI: American Concrete Institute, Box 19150, Detroit, Michigan, 48219.

B. All concrete shall be proportioned, mixed, placed, finished, and cured in accordance with the requirements of ACI 301 "Specifications for Structural Concrete for Buildings", as modified herein, except that concrete for pavement, including sidewalks, driveways, and curb and gutter shall be placed, finished, and cured in accordance with ACI 316.

##### 1.3 MATERIALS - GENERAL

A. Except where specifically noted otherwise, all concrete shall be readymix, normal weight, as produced by a plant acceptable to the Engineer. Job-mix concrete may be used for small quantities upon specific approval of the Engineer.

#### PART 2 - MATERIALS

##### 2.1 CEMENT

A. Cement shall be a single brand of approved American made Portland cement conforming to ASTM C150. All cement shall be gray in color including cement for concrete to receive special finishes.

B. Air-entraining cement shall not be used.

C. Unless otherwise noted, Type I (normal) cement shall be used only in precast prestressed elements: lightweight concrete; concrete cradles; encasements and thrust blocks; concrete fill other than in tanks containing sewage; concrete cast-in-place piling; concrete pavement, sidewalks,

curbs, gutters and driveways.

D. Unless otherwise specified, Type II (sulfate-resistant) Portland cement shall be used in all other concrete and may be used where Type I is specified.

E. Type III (high-early-strength) cement may be used only with the written permission of the Engineer, but no additional payment will be made to the Contractor for the use thereof.

F. In addition to the requirements of ASTM C150, cements to be used in exposed concrete shall exhibit no efflorescence when tested in accordance with ASTM C67.

G. All cement to be used in the work shall be subject to testing to determine conformity to the requirements of the specifications. The methods of testing shall conform to the appropriate specifications but the place, time, frequency, and method of sampling will be determined by the Engineer in accordance with the particular conditions of this project. If required by the Engineer, the Contractor shall furnish sworn certificates of mill tests of cement, in triplicate, at least 7 days before the cement will be used. The Owner reserves the right to make such independent tests as he may deem necessary at any time.

H. Cement which is partially set or which is lumpy or caked shall not be used and the entire contents of the sack of cement or the container of bulk cement which contains damaged, partially set, or lumps of caked cement will be rejected for use.

## **2.2 AGGREGATES**

A. All aggregates shall be fine washed, natural sand, conforming to ASTM C33.

B. When directed, the Contractor shall furnish clearly labeled samples of aggregates to the Engineer for approval.

## **2.3 ADMIXTURES**

A. Admixtures causing accelerates setting of cement in concrete or containing chloride ions shall NOT be used.

B. Admixtures to provide air entrainment shall conform to ASTM C260.

C. No other admixture shall be used except with the specific approval of the Engineer.

## **2.4 WATER**

Mixing water for concrete shall be clean, fresh, and suitable for drinking and shall not contain injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances. Water from any source other than a municipal water supply shall be shown by test to comply with Florida DOT requirement for mixing water.

## **2.5 CONCRETE QUALITY**

A. Concrete shall have the following minimum compressive strengths when tested at 28 days in accordance with ASTM C172, ASTM C31 and ASTM C39:

Class A	4,000 psi
Class C	2,500 psi

B. Unless otherwise specified or noted, class of concrete shall be as follows:

Sidewalks, curb and gutter, splash blocks, pipe cradles and encasements, thrust blocks, and other non-structural concrete as approved by Engineer ----- Class C All other concrete ----- Class A

Class A concrete may be used at the option of the Contractor wherever Class C is specified, but at no additional cost to the Owner.

C. Concrete, when placed, shall be of a plastic consistency such that it can be readily worked into all parts of the forms and around embedded items without segregation of materials or accumulation of free water on the surface. Except as specified otherwise for special finishes, slump as measured in accordance with ASTM C143 shall be as follows:

<u>Class</u>	<u>Not Less Than</u>	<u>Not More Than</u>
A	1-1/2 inches	3-1/2 inches
C	2 inches	5 inches

D. Air entrainment, as determined in accordance with ASTM C173 of not less than 4 nor more than 6 percent by volume, shall be provided in Class A concrete and Class C concrete exposed to weather, frost, or groundwater.

## 2.6 CONCRETE PROPORTIONS

A. Materials used in concrete shall be proportioned in accordance with ACI 211.1 and approved by the Engineer as provided in Paragraph 9.2. Class A concrete shall be proportioned to provide a water/cement ratio not to exceed 0.45 and a cement content of not less than 564 pounds per cubic yard.

B. Submit to the Engineer for approval not less than 7 days before concrete is to be placed, in duplicate, a report certified by an independent testing laboratory containing the following:

1. Recommended proportions of materials to be used in concrete.
2. Result of the testing of all materials in accordance with ASTM specification including sieve analysis, specific gravity, and dry-rodded weight of aggregates.
3. Result of testing laboratory trial batches in accordance with ASTM C39 and C192.

C. All testing and analyses of materials shall have been done not more than 4 months prior to the date of submission and the certified report shall state the date thereof.

D. Proportions of materials shall be based on accurate measurements thereof by weight taken separately.

E. Costs of the services of the independent testing laboratory in testing materials and determining mix proportions shall be borne by the Contractor.

## 2.7 PLANT APPROVAL

The Engineer, or his authorized representative, shall have the right and shall be afforded any facility to inspect the plant where concrete is batched including materials used and methods of proportioning, mixing, and delivery of concrete; all of which shall be in accordance with the specifications and meet the approval of the Engineer. No readymixed concrete shall be ordered until the Engineer has given his approval thereof.

## 2.8 MIXING AND DELIVERY

A. Readymixed concrete shall be used. All mixing requirements specified herein shall be enforced and the Owner's laboratory representative and the Engineer shall have free access to the mixing plant at all times. Except for material and/or procedure otherwise specified herein, readymixed concrete shall be mixed and delivered in accordance with the requirements of ASTM C94. No water shall be added to the concrete after it leaves the plant except as specifically approved by the Engineer and it shall be so noted on the batch ticket.

B. Neither the speed of any mixer nor the quantity of material loaded into any mixer shall exceed the recommendations of the manufacturer. Excessive mixing, requiring additions of water to preserve the required consistency, shall be cause for rejection of the batch. Concrete shall not remain in a transit mixer or agitator truck more than 90 minutes after the water is introduced (and not more than 45 minutes if an approved retarding agent is not used). Minimum mixing time shall be 50 revolutions of drum at rated speed.

C. Equipment necessary to determine and control the actual amounts of all materials entering the concrete shall be provided by the concrete manufacturer. All materials shall be measured by weight, except that water may be measured by volume calculated at 8-1/3 pounds per gallon. One bag of cement will be considered as 94 pounds in weight.

D. Accompany each batch of concrete delivered to the site shall be a trip ticket that shall indicate the following information: (1) time mix was batched stamped on ticket, (2) brand and type of cement, (3) bags of cement per cubic yard of concrete, (4) planned slump, (5) admixture, and (6) name of supplier. These tickets shall be given to the Engineer when the truck arrives on the job.

E. Attention is directed to the importance of dispatching trucks from the batching plant so that they shall arrive at the site of the work just before the concrete is required, thus avoiding excessive mixing of concrete while waiting. Concrete shall be discharged into forms according to the time limits below after water was first added to the mix and shall be mixed at least 5 minutes after all water has been added.

### 1. Time Schedule

<u>Ambient Temperature</u>	<u>Time Limit</u>
Less than 85 degrees F	90 minutes
85 degrees F or greater	

## 2.9 FORMS

A. Forms shall be securely braced, substantial and unyielding, and of sufficient strength to hold the concrete without bulging between supports, or without deviation from the neat lines as shown on the drawings. Forms shall be mortar tight and shall be constructed of pre-fabricated metal, plywood, or dressed lumber of uniform thickness, with or without a form liner. Where concrete structures are circular or are otherwise shown to have curved surfaces, forms shall be constructed to provide such curvature and shall not consist of a series of flat surfaces.

B. The spacing of joists and wales shall be such as to prevent warp and bulging and to produce true and accurate surfaces. All form facing shall be free from knot holes, loose knots, cracks, splits, warps, or other defects affecting its strength or the appearance of the finished concrete surface. Fiber board or other manufactured material, approved by the Engineer, may be used as a lining for forms. Where a grout finish is specified, form facing shall be of plywood or other approved material with the number of seams kept to a practical minimum and arranged in an orderly and symmetrical manner.

C. The interior surfaces of forms shall be adequately oiled, greased, or soaped to prevent adhesion of mortar. Form oil for exposed work shall be non-staining. Before placing of concrete the forms shall be cleaned of all dirt, sawdust, shavings, or other debris and the surfaces shall be dampened.

D. Special care shall be exercised to secure smooth and tight-fitting forms which can be rigidly held to line and grade and removed without injury to the concrete. All corners in the finished work shall be true, sharp, and clean cut. Alignment of forms and grade of top chamfer strips shall be checked immediately after the placing of concrete in the forms.

E. Forms shall not be removed until the product of the elapsed number of days after placement and the average daily air temperature at the surface of the concrete equals 100 for walls and vertical surfaces and 500 for slabs and beam soffits and other parts that support the weight of the concrete.

F. In addition to the above, shores under beams and slabs shall not be removed until the concrete has attained at least 60 percent of the specified cylinder strength and also sufficient strength to support safely its own weight and the construction live loads upon it. Shores under cantilevers shall remain in place at least 14 days after concrete is placed.

G. Round forms may be constructed of spirally laminated plies of fiber. Total wall thickness shall be as specified by manufacturer with 6 inch (minimum) wide plies. Provide polyethylene coating on interior surface. Approved: A-Coated Sonotube.

H. Chamfer strips made from dressed dimensional 1 inch by 1 inch lumber cut on the diagonal shall be installed at the top of the forms on all exposed edges of walls, slabs, beams, exposed outside corners, and other structures above grade.

I. Drip edge shall be made from wood quarterround and installed where shown. Extruded plastic fillets shall be used where detailed.

## **2.10 REINFORCING STEEL**

In general, reinforcing steel shall conform to the specifications set forth in ACI-301. All reinforcing shall be furnished substantially free from mill scale, rust, dirt, grease or other foreign matter. Reinforcing bars shall conform to the requirements of ASTM A615, Grade 60. All bars number 3 and larger shall be deformed bars.

Reinforcing steel shall be detailed, fabricated and placed according to the methods and standards recommended in the Specifications for Structural Concrete for Buildings, ACI 301.

Splices in reinforcing mats shall be staggered. Horizontal mats shall be supported on metal chairs with all sills or pads below subgrade. Spacers shall be provided for wall and column steel and shall be removed as the concrete is placed.

Wire fabric, unless otherwise shown or specified, shall be 6 inches by 6 inches - No. 10 woven or electrically welded wire fabric conforming to the requirements of ASTM A185.

## **2.11 EMBEDDED ITEMS**

A. All sleeves, inserts, hangers, anchor bolts, dowels, nailing strips, or other embedded items shall be accurately set and firmly held in place while the concrete is deposited. Anchors and ties for masonry shall be provided as shown on the drawings or called for in the masonry specifications.

1. All ferrous metals embedments shall be hot dip galvanized after fabrication.
2. All aluminum embedments shall be coated with an approved coating to protect them from direct contact with the concrete.

B. Pipes, conduits, and other items embedded in the concrete shall be so placed and held that they do not misplace the reinforcing or weaken the concrete at points of maximum stress or where the concrete section is not sufficient to permit the reduction of area caused by the embedment.

C. Waterstops shall be 9 inch hollow bulb dumb-bell type PVC for expansion joints, 6 inch flat dumb-bell type for construction joints. All waterstops shall have a minimum thickness of 1/4 inch. Waterstop material shall be continuous with joints made completely waterproof by fusion or solvent welding; welding shall develop 50 percent of the mechanical strength of the \_\_\_\_\_ section and shall permanently retain its flexibility.

1. All joints below grade shall have waterstops.
2. All joints in hydraulic structures shall have waterstops to a point two feet above the design overflow level.
3. All expansion joints shall be full height of the wall.

D. All embedded items shall be thoroughly cleaned removing all rust, scale, oil, or other foreign matter prior to placing concrete. Drains, pipes, hollow inserts, and similar items shall be protected as approved by the Engineer to prevent the intrusion of concrete.

## **PART 3 - EXECUTION**

### **3.1 PLACING CONCRETE**

A. Concrete shall be placed in accordance with ACI 301.

B. All concrete shall be placed during daylight hours allowing sufficient time for adequately finishing the concrete surfaces during daylight hours. The Contractor shall give the Engineer twenty-four (24) hours notice of intent to place concrete to enable prior inspection of forms and of conditions incidental to the pour. No concrete shall be placed until the forms have been approved by the Engineer and until all the reinforcement is in place and has been inspected and approved by the Engineer. No concrete shall be placed in water and forms shall be free from water, dirt, debris, or any foreign matter when concrete is placed. Normal weather limitations for placing concrete shall be adhered to and no concrete shall be exposed to the action of water before final setting.

C. The method and manner of placing concrete shall be such as to avoid the possibility of segregation or separation of the aggregates. If the quality of concrete as it reaches its final position is unsatisfactory, the method of placing shall be discontinued or adjusted until the quality of the concrete as placed is satisfactory. Open troughs or chutes shall be of metal or metal-lined.

Where steep slopes are required, the chutes shall be equipped with baffles or shall be in short lengths that reverse the direction of movement. Where placing operations would involve dropping the concrete freely more than five feet, it shall be deposited through pipes of sheet metal or other approved material. Troughs, chutes, or pipes with a combined length of more than 30 feet shall be used only on written authority from the Engineer. All troughs, chutes, and pipes shall be kept clean and free from coatings of hardened concrete by being thoroughly flushed with water after each run or in its final position. Depositing a large quantity at any point and running or working it along the forms shall not be done. Special care shall be taken to fill each part of the forms and to work the coarse aggregate back from the face and to force the concrete under and around the reinforcing bars without displacing them. The concrete consistency as measured by slump shall be as specified herein.

D. Concrete shall be consolidated in accordance with ACI 309 in a manner acceptable to the Engineer. Vibration shall be done by experienced operators under close supervision and the duration shall be held to the minimum necessary to produce thorough compaction without segregation. Where vibrators are not used, all thin section 6 inch maximum thickness work shall be thoroughly worked with a steel slicing rod. All faces shall be well spaded and the mortar flushed to the surface by continuous working with a concrete spading implement acceptable to the Engineer.

E. In all cases where, on account of the obstructions produced by reinforcing metal, shapes or forms, or any other uncontrollable conditions, difficulty is encountered in puddling the concrete adjacent to the forms, the mortar content of the mix shall be brought into proper contact with the interior surfaces by vibrating the forms. The vibrations shall be produced by striking the outside surfaces of the form with wooden mallets or by other means satisfactory to the Engineer.

F. No concrete placing shall begin or continue without the express approval of the Engineer each day for each location if the ambient air temperature is less than 40 degrees Fahrenheit, or is predicted to fall below 36 degrees Fahrenheit during the next 24 hours, or 32 degrees Fahrenheit during the next 72 hours. Temperature of concrete when placed shall not be less than 55 degrees Fahrenheit. Chemicals to lower freezing temperature of concrete shall not be used.

G. When the ambient air temperature is 90 degrees Fahrenheit or above, the Engineer may require pre-cooling of aggregates with water sprays and scheduling of placing successive layers of concrete so as to cause maximum release and dissipation of the heat of setting, or other protective measures. In no case shall temperature of the concrete, forms, or reinforcing exceed 90 degrees Fahrenheit when concrete is being placed and, if necessary, forms and reinforcing shall be cooled by water spray prior to pouring concrete.

### **3.2 TEST SAMPLES**

A. The Contractor will retain an independent testing laboratory to perform the sampling and testing of concrete furnished. Cost of the services of the laboratory will be borne by the Contractor with payment therefor made directly to the laboratory. The laboratory's representatives shall have free access to all points where concrete materials are stored, proportioned, mixed, or placed and the Contractor shall provide on-site facilities as needed by the laboratory to secure and store samples.

B. For each 100 cubic yards or portion thereof of each class of concrete placed each day, the laboratory shall take a sample from a batch of its selection as the concrete is being placed. No water shall be added or other change made in any batch after it has been sampled. In addition to other tests, the laboratory will make a set of 4 standard compression cylinders from each sample, one of which will be tested at 7 days, two tested at 28 days and one held in reserve. The Engineer will be furnished with a report of each test made. Testing of concrete at other times as needed by the Contractor will be at his expense and the Engineer shall be furnished with a report of all such tests made.

C. The Contractor shall advise the Engineer with 24 hours advance notice of the time and location of all concrete placing and make arrangements with the laboratory for the testing.

D. Compressive strength of a sample shall be determined by the average of the two cylinders tested at 28 days. Compliance with the strength requirements of these specifications shall be verified if the average compressive strength of three consecutive samples is not less than the specified strength for the class of concrete, provided no individual sample shall have a strength test result that falls below the specified strength by more than 500 psi.

E. Concrete which fails to meet strength requirements may be further tested as provided in ACI 318 at the expense of the Contractor or shall be removed as determined by the Engineer.

F. If tests indicate that concrete delivered to the site does not comply with these specifications, the Engineer may reject such concrete and order changes in materials or proportioning for subsequent work. Rejected concrete shall be removed from the job and replaced as directed by the Engineer.

G. The Engineer may waive testing requirements on small quantities or concrete elements where strength is not critical.

### **3.3 CURING AND PROTECTION**

A. All concrete work shall be protected against damage from the elements and defacement of any nature during construction operations.

B. Water shall not be permitted to rise on concrete within 24 hours after it is placed, nor shall running water be allowed to flow over completed concrete within four days after it has been placed.

C. All concrete shall be cured in accordance with ACI 308 and shall be treated immediately after concreting or cement finishing is completed to provide continuous moist curing for at least seven days, regardless of the adjacent air temperature. Walls and vertical surfaces may be covered with continuously saturated burlap or kept moist by other approved means. Horizontal surfaces, slabs, etc., shall be ponded to a depth of 1/2" wherever practicable or kept continuously wet by the use of lawn sprinklers, a complete covering of continuously saturated burlap, or by other approved means. The Contractor may, at his option, use a membrane curing compound approved by the Engineer in lieu of water curing of concrete, provided such compounds shall not be used on surfaces that are to receive additional concrete, paint, tile, or other materials that require a positive bond, unless it has been demonstrated that the membrane can satisfactorily serve as a base for such additional applications. The compound shall comply with ASTM C309 and be compatible with floor hardeners used, shall be delivered to the job in the manufacturer's containers, and shall be applied in strict accordance with the manufacturer's printed instructions.

D. Curing compound for exposed surfaces shall be non-staining.

E. For at least seven days after having been placed, all concrete shall be so protected that the temperature at the surface will not fall below 50 degrees Fahrenheit.

F. No manure, salt, or other chemicals shall be used for protection.

G. The above mentioned seven-day periods may be reduced to three days in each case if high-early-strength cement, as described in Paragraph 2.1.E., is used in the concrete.

H. Wherever practicable, finished slabs shall be protected from the direct rays of the sun to prevent checking and crazing.

### **3.4 FINISHING - GENERAL**

A. Unless otherwise noted, strike off concrete surfaces to elevations and profiles indicated and finish with wood or cork float or steel trowel as hereinafter specified, even and true, free from cracks, pockets, or other imperfections. Discontinue as soon as water appears on surface. Finishes, except at warped surfaces, shall be such that irregularities shall not exceed 1/4" as measured by a 10' straight edge.

B. Following removal of forms, thoroughly wet all surfaces to remain exposed. Fill all honeycombs, tie rod holes, and areas damaged in form removal with grout composed of one part Portland cement to two parts of sand, with water as required, and rub with abrasive stones to smooth, uniform surface.

C. Any work not formed as indicated on the drawings or that is not of alignment or level or shows a defective surface shall be corrected in a manner satisfactory to the Engineer.

D. It is expected that forms, concrete, and workmanship shall be such that the quantity of trimming and repair work is kept to a minimum. Defective concrete shall be cut normal to the surface until sound concrete is reached, but not less than 1" deep; the remaining concrete shall be thoroughly roughened and cleaned.

E. All exposed concrete surfaces, except troweled surfaces and the interior surfaces more than 6 inches below low water level of all concrete tanks, channels, and conduits (both open and covered) which will contain or transmit water, sewage, or sludge, shall be given a grout finish application. Exterior walls shall be so finished to a point 12" below final grade. This operation shall not be undertaken until all the concrete work for the particular structural unit is completed and all mortar splatter and soil stains have been removed.

F. The grout finish shall be 1:1 by volume cement-sand grout using sand passing the No. 16 sieve. The surface shall be cleaned, thoroughly wetted, and the grout mixed to creamy consistency shall be scrubbed into the surface with a stiff brush. Defective or loose concrete shall be removed and repaired to the satisfaction of the Engineer prior to grouting. Grout shall be cured a minimum of three (3) days by keeping continuously moist with wet burlap or water spray.

G. Unless otherwise specified, all surfaces not built against forms, such as surfaces of pit floors or tank bottoms and similar surfaces, shall be accurately screened to the required form, wood floated, and steel troweled to a hard even finish. All slabs, walks, and pavement shall be lightly broomed after troweling. The brooming shall be sufficient to mark the surface without appreciably disturbing the troweled finish. Slabs to be painted shall not be broomed.

H. Unless otherwise directed, all edges and corners which will be exposed to the finished work shall be beveled or rounded by the use of appropriate forms or form inserts, and care shall be taken to prevent chipping or cracking of finished edges.

### **3.5 NON-SHRINK GROUT**

A. Grout, where called for on the drawings, shall be non-shrink grout. Non-shrink grout shall be a proprietary type grout composed of pre-mixed grouting cement, aggregates, and appropriate additives to which only water needs to be added at the site to produce the finished product. Amount of water to be added shall be the minimum required for the intended purpose (depending on whether it is a dry-pack or self-leveling application) and it shall be in accordance with the manufacturer's instructions. The grout shall be specially formulated to make it absolutely non-shrink and the supplier shall be able to furnish test data from an independent testing laboratory proving their grout to be non-shrink under the conditions of usage anticipated. It shall also be a grout that will have a seven day strength not less than 4,000 psi. The grout shall be placed in a manner that will insure complete filling in of holes under base plates and complete

contact with the plates. Exposed surfaces of the non-shrink grout shall be such that it is not subject to corrosive erosion or staining, due either to pertaining to them, and methods of installation shall be submitted for approval to the Engineer during the shop drawing submittal period. Approved for this material are Embeco 636 Grout and/or Masterflow 713 Grout, as manufactured by the Master Builders Company, or equal.

### **3.6 MEASUREMENT AND PAYMENT**

A. No additional payment shall be made for the work hereinbefore specified. The Contractor's lump sum bid as set forth in the PROPOSAL shall constitute full compensation for the work involved for each item.

**END OF SECTION**

## **SECTION 1A**

### **TERMITE CONTROL TREATMENT**

#### 1A-01. **GENERAL CONDITIONS:**

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

#### 1A-02. **SCOPE:**

The compacted soil under all new interior concrete floor slabs and around all foundation walls shall be chemically treated prior to vapor barrier being placed. Materials, applications, and standards shall comply with the Florida Building Code 2007, Section 1816.

#### 1A-03. **MATERIALS:**

Shall be Termidor or a chemical that is approved by the State of Florida for pretreatment. Proof shall be provided that no toxic effects to humans or beneficial plant or animal life will result from its use.

#### 1A-04. **RATES OF APPLICATION:**

- A. Rate of application shall be as per manufacturer's label for chemical use at full label rate.
- B. Treatment shall be full coverage below the concrete slabs and along the inside of all foundation walls or interior partitions and around any openings in the interior of the slab cut or left for pipes, conduits, etc.

#### 1A-05. **MATERIAL SAMPLE:**

Prior to application of the chemical, if required by the Architect, this contractor shall, in the presence of the Architect, fill a sealable sample bottle of at least 8 fluid oz. of the mixture to be applied. Testing of the mixture shall be by the Entomology Department, State of Florida Department of Agriculture. The label of the mixture used shall be provided with the sample of the mixture.

#### 1A-06. **APPLICATION TECHNIQUE:**

Treatment shall not be made when the soil is excessively wet or immediately after heavy rains to avoid the surface flow of the toxicant from the application site. Unless the treated soil is to be promptly covered with drainage fill and vapor barrier, adequate precautions must be taken to prevent disturbances of the treatment and human or animal contact with the treated soil.

1A-07. POST-TREATMENT:

Upon completion of construction and completion of all grading around the building and in accordance with the material label, a final application shall be made entirely around the perimeter of the building and at the rate as directed on the materials label. **Post-treatment shall be done during the substantial completion inspection, and the Architect shall be present.**

1A-08. SUBMITTAL:

Prior to application, submit all information showing the type of chemical and rate of application for approval.

1A-09. WARRANTY:

After all the above has been done, the termite control subcontractor shall provide the Owner a written five (5) year warranty, fully guaranteeing his work and providing any treatment and repairs necessary during that period. A five-year warranty shall include all inspections that may be required under the warranty.

**END OF SECTION**

## **SECTION 1B**

### **RODENT PROOFING**

#### 1B-01. **GENERAL CONDITIONS:**

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

#### 1B-02. **SCOPE:**

Buildings or structures and the walls enclosing habitable or occupied rooms and spaces in which persons live, sleep or work or in which feed, food or foodstuffs are stored, prepared, processed, served or sold, shall be constructed in accordance with the provisions of this section.

#### 1B-03. **FOUNDATION WALL VENTILATION OPENINGS:**

Foundation wall ventilator openings shall be covered for their height and width with perforated sheet metal plates no less than 0.070 inch (1.8mm) thick, expanded sheet metal plates not less than 0.047 inch (1.2mm) thick, cast iron grills or grating, extruded aluminum load bearing vents or with hardware cloth of 0.035 inch (0.89mm) wire or heavier. The openings therein shall not exceed ¼ inch (6.4 mm).

#### 1B-04. **FOUNDATION AND EXTERIOR WALL SEALING:**

Annular spaces around pipes, electric cables, conduits, or other openings in the walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or non corrosive metal.

#### 1B-05. **DOORS:**

Hollow metal doors and doors on which metal protection has been applied shall be hinged so as to be free swinging. When closed, the maximum clearance between any door, door jambs and sills shall not be greater than ¼ inch (9.5mm).

#### 1B-06. **WINDOWS AND OTHER OPENINGS:**

Windows and other openings for the purpose of light or ventilation located in exterior walls within 2 feet (610mm) above the existing ground level immediately below such openings shall be covered for their entire height and width, including frame, with hardware cloth of at least 0.035 inch (0.89mm) wire or heavier.

- A. **Rodent - accessible openings:** Windows and other openings for the purpose of light and ventilation in the exterior walls not covered in this chapter, accessible to rodents by way of exposed pipes, wires, conduits and other appurtenances, shall be covered with wire

cloth of at least 0.035 inch (0.89mm) wire. In lieu of wire cloth covering, said pipes, wired, conduits and other appurtenances shall be blocked from rodent usage by installing solid sheet metal guards 0.024 inch (0.61mm) thick or heavier. Guards shall be fitted around pipes, wires, conduits, or other appurtenances. In addition, they shall be fastened securely to and shall extend perpendicularly from the exterior wall for a minimum distance of 12 inches (305mm) beyond and on either side of pipes, wires, conduits or appurtenances.

1B-07. PIER AND WOOD CONSTRUCTION:

- A. Sill less than 12 inches above ground: Buildings not provided with a continuous foundation shall be provided with protection against rodents at grade by providing either an apron in accordance with Section F101.6.1.1 or a floor slab in accordance with Section F101.6.1.2
1. **F101.6.1.1 Apron.** Where an apron is provided, the apron shall not be less than 8 inches (203mm) above, nor less than 24 inches (610mm) below grade. The apron shall not terminate below the lower edge of the siding material. The apron shall be constructed of an approved non-decayable, water-resistant rodent-proofing material of required strength and shall be installed around the entire perimeter of the building. Where constructed of masonry or concrete materials, the apron shall not be less than 4 inches (102mm) in thickness.
  2. **F101.6.1.2. Grade Floors.** Where continuous concrete grade floor slabs are provided, open spaces shall not be left between the slab and walls, and openings in the slab shall be protected.
- B. Sill at or above 12 inches above ground: Buildings not provided with a continuous foundation and which have sills 12 or more inches (305mm) above the ground level shall be provided with protection against rodents at grade in accordance with any of the following:
1. Section F101.6.1.1 or F101.6.1.2:
  2. By installing solid sheet metal collars at least 0.024 inch (0.6mm) thick at the top of each pier or pile and around each pipe, cable, conduit, wire or other item which provides a continuous pathway from the ground to the floor; or
  3. By encasing the pipes, cables, conduits, or wires in an enclosure constructed in accordance with Section F101.6.1.1

**END OF SECTION**

## SECTION 6A

### CARPENTRY, MILLWORK, AND INSULATION

6A-01.        GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

6A-02.        SCOPE:

The contractor shall furnish all labor and materials for carpentry, millwork and case work as indicated on drawings or specified, or reasonably required to finish the work. Work under this heading shall be properly coordinated with all other trades. The carpenter shall do all cutting and fitting for carpentry and millwork, and render all such other assistance required for other branches of the work, making good after other mechanics.

6A-03.        LUMBER, IN GENERAL:

All lumber shall be thoroughly seasoned and dried to a moisture content of not over 10% for framing lumber and not over 12% for millwork, and when delivered shall be stored and protected to keep same dry.

All lumber for any purpose shall be dressed four (4) sides, unless otherwise noted and be free from holes, large loose knots, bark and large pitch streaks, regardless of grade.

Grading shall be according to grading rules of the Southern Pine Inspection Bureau under which it is manufactured and each piece of bundle, if bundled stock, shall bear an Inspection Bureau's mark, indicating the grade.

Doors, trim, and millwork in general shall not be stored in the building while the building is damp or in any damp storage location.

6A-04.        LUMBER GRADES:

All trim shall be No. 1 Fir. All blocking "cant" strips, grounds or nailers shall be pressure treated No. 2 grade, Yellow Pine; wood studs and wood joists shall be Fir or Yellow Pine structural grade.

6A-05.        TREATED LUMBER:

- A.    Structural Lumber: Give all nailers, blocking and wood grounds in contact with exterior masonry, concrete, roof slabs or steel, pressure preventative treatment in closed retort as per FS TT-W-571; minimum net preservatives as specified herein. Any of the following preservatives will be acceptable:

<u>Preservative</u>	<u>Lbs. Per Cu. Ft.</u>
Pentachlorophenol (5% solution in oil)	Solution 6.0

Zinc Chloride	Dry Salt 1.0
Zinc Metal Arsenite (ZMA)	Dry Salt .03
Wolman Salts (Tanalith)	Dry Salt 0.3
Chromated Zinc Chloride	Dry Salt 0.75

After using the salt treatment, reduce lumber moisture content to not over 10%. Brush coat surfaces of lumber sawed, bored or cut, after treatment with same preservative used at plant. Accompany lumber with certificates from lumber treatment company, certifying treatment amount, moisture percentage after kiln drying. Architect reserves the right to apply method for determining penetrating as per manual issued by the American Wood Preserver's Association. Treatment shall be arsenic free.

6A-06.        METAL GLASS STOPS:

All wood doors shown or noted with glass lights shall have metal stops. Stops shall be Type FGS75 for single glazing and shall be as manufactured by Anemostat Door Products. **Install stops with stainless steel through bolts.**

6A-07.        MILLWORK:

Millwork shall be of material and manufacturer hereinafter specified and as indicated on the drawings and shown on details. In all cases millwork shall be of good standard construction. All joints shall be made in approved manner perfectly fitted. Secure with finishing nails with heads set for putty, and with screws and glue where required. All surfaces sanded smooth.

All trim and moldings shall be mitered at joints and corners and in full lengths within the limits of the material.

No sheet plywood shall be less than ¼" thick, exposed surfaces, Grade A. Frames shall be primed on all sides at the mill with clear primer.

6A-08.        TRIM:

Trim shall be as indicated on drawings or if not noted shall match specie of doors, siding, and paneling used. All other trim shall be as specified above, No. 1 Fir. All cuts in trim shall be painted with clear Rez during erection. All trim work including bonding on cabinets and cabinet work shall have mitered corners.

6A-09.        PLASTIC LAMINATE:

Surfaces where detailed shall be standard grade plastic laminate, 1/16" thickness, furniture finish, color as selected. Edges are to be covered with laminate. Counter top sheet shall overlap counter edge and corners ground to a 45-degree angle. Laminate shall be Formica, Micarta, Wilson Art, or equal. Colors shall be of solid colors as selected. **Other than manufactured casework items, all millwork, window sills, and other surfaces shown with plastic laminate, plastic laminate shall be field applied.**

6A-10.        ROUGH HARDWARE:

The contractor shall furnish all nails, screws, bolts and fittings required to fabricate and install his work in

place of the character required and best suited to the conditions of the work.

6A-11. APPLICATION OF FINISH HARDWARE:

Finish hardware is specified under another Section. Fit and apply all finish hardware to wood doors and leave same in operating order. All mortises, sinkages and cuts shall be accurately made to fit or be covered by hardware. Screws shall be counter sunk or counter bored and plugged as specified. All screws shall be screwed in place and not hammered. (After the finish hardware has been fitted, remove the same until the painter has applied the last coat of paint on every surface, then reset in place.) See the Carpet Section and Finish Hardware Section for aluminum saddles at doors between corridors and rooms.

6A-12. WOOD DOORS: See Section 8B-05.

6A-13. DOOR LOUVERS:

All door louvers are to be furnished by others and installed by this Contractor.

6A-14. CAULKING:

Where backsplashes and/or countertops finish against plastic walls, the joint shall be caulked with a Thiokol caulking compound before painting.

6A-14. PLYWOOD:

All plywood shall have markings stamped on sheets for grades and thicknesses called for. Where used for exterior applications, plywood is to be exterior grade with exterior glue.

6A-15. ROOF INSULATION: See Section 7A-12

6A-16. EXTERIOR WALL CAVITY INSULATION: N.A.

6A-17. INTERIOR WALL SOUND BATTS:

Install interior wall sound batts at interior metal stud framed wall construction as shown in drawings equal to un-faced sound attenuation batts fiber glass as manufactured by Owens Corning with the following characteristics:

<u>Thickness:</u> 3 ½"	<u>Width:</u> 16"	<u>Length:</u> 96"	
<u>Surface Burning Characteristics / Rating:</u>	Flame Spread Rating		10
	Smoke Developed Rating		10
<u>Acoustical Performances:</u>	N.R.C. (Noise Reduction Coefficient)		1
<u>Thermal Performance:</u>	R-Value		11

6A-18. INTERIOR CEILING SOUND BATTS:

Install interior ceiling sound batts at interior ceilings as indicated on drawings equal to un-faced Sono Batts Insulation Fiberglass as manufactured by Owens Corning with the following characteristics:

Thickness:	3 ½"	Width:	24"	Length:	48"	
Surface Burning Characteristics / Rating:		Flame Spread Rating				10
Smoke Developed Rating						10
Acoustical Performances:		N.R.C. (Noise Reduction Coefficient)				1
Thermal Performance:		R-Value				11
Thickness:	6 ¼"	Width:	24"	Length:	48"	
Surface Burning Characteristics / Rating:		Flame Spread Rating				10
Smoke Developed Rating						10
Thermal Performance:		R-Value				19
Thickness:	9 ½"	Width:	24"	Length:	48"	
Surface Burning Characteristics / Rating:		Flame Spread Rating				10
Smoke Developed Rating						10
Thermal Performance:		R-Value				30

6A-19. CLEAN-UP:

The Contractor shall remove all debris, scrap, etc., from the site upon completion of his work. Tile shall be free of all fingerprints, smudges, and present a uniform color, clean, and level. Any tile found to contain smudges, chips, etc., shall be removed and replaced with a new tile.

6A-20. GUARANTEE:

This contractor shall guarantee in writing the materials and workmanship for a period of two (2) years after final acceptance of the building.

**END OF SECTION.**

## SECTION 7A

### METAL ROOFING & WALL PANELS

#### 7A-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications, shall apply to the form part of this Section as if written in full herein.

#### 7A-02. SCOPE OF WORK

- A. Furnish all labor, material, equipment and incidentals necessary for installing all new roofing and fascia panels, including required trim, flashing, framing and supports for new metal roofing and fascia panels, and other related items as indicated on the drawings and as specified, and/or as required to complete the work.

Generally, the roofing system will consist of installing a standing seam 24-gauge metal panel roofing over a loadmaster or light gauge framing system as shown on the drawings for each of the three buildings.

#### 7A-03. INCIDENTAL WORK:

All work which is incidental to the installation of the roof and fascia shall be done by this Contractor. This includes flashing, trim, gutter and downspouts and any other items related to the above roofing areas, fastening and any support work required to complete the installation.

#### 7A-04. METAL ROOF AND ACCESSORIES:

- A. Manufacturers: Metal roofing and fascia panels shall be one of the manufacturers listed below. Panels from other manufacturers will be acceptable providing they conform to the same shape, size, gauge, method of fastening and type of finish. **Contractors proposing to use roof panels other than as specified shall submit sample panel showing fastening system and panel specifications prior to receipt of bids for approval.** (See Section B, paragraph B-5, Substitutions, these Specifications)

All roof and fascia panels as listed below, shall be flat panels and shall be 16" wide and have a 2" high standing seam and of 24 gauge galvanized steel. All roofing materials shall be labeled Class "A" per ASTM 108 and shall be certified by a nationally recognized independent testing laboratory. All roofing systems shall be installed within the limitations of the test procedure for surfaces, deck cross slope and combustibility.

Insulation, moisture protection, roofing, thermal requirements, fireproofing and fire stopping shall be designed and constructed in compliance with the Florida Building Code and the Florida Fire Prevention Code as adopted by the State Fire Marshall.

All newly installed materials shall be protected from moisture and sealed for moisture protection at the end of each day. The contractor shall provide the Architect / Engineer of record a final statement of compliance for the Board.

B. Acceptable Manufacturers:

1. VSR Roof System, Butler Standing Seam, 16" wide, 2" high seam, Butler Manufacturing Company.
2. American Loc-Seam Panel, 16" wide, 2" high seam, American Buildings Company.
3. Berridge Zee-Lock Panel, 16" wide, 2" high seam, Berridge Manufacturing Co.
4. M and M Series 300 Style 316.
5. ARS, Architectural Roof Systems, 16" wide, 2" high seam.
6. Englert KR 24 Panel, 16" wide, 2" high 90° seam, Englert, Inc.
7. Battenlok 16" wide x 2" high rib panels as manufactured by MBCI Metal Roofing and Wall Systems.

C. Roof and Fascia Panels:

1. Roof and fascia panels shall be a manufactured non-embossed structural, 24-gauge panel of 50,000 psi minimum yield steel, with a material Galvalume coating, conforming to ASTM A792. Panels shall be 16" wide and have a minimum of 2" deep male and female rib. All panels shall be a mechanically seamed rib panel.

**All panels shall be full lengths from ridge to top of fascia as detailed. End splices will not be acceptable on any of the portions to be roofed.** Furnish with end inserts to close batten void at end of panel and C closer at top of panels.

2. Fastening of roof panels to support framing shall be by a concealed fastener system, so no screws penetrate the face of the roofing panel nor are any screws visible. Where shown on the drawings, thermal spacers shall be installed between the insulation and bottom face of the panel to provide a positive thermal break between the roof panels and supporting members.

Concealed Z clip shall be a minimum 2" long, 3" high of not less than 24 gauge aluminized steel (min. yield 48,000 psi).

3. Sealant shall be either factory or field applied in longitudinal female rib of all panels regardless of roof panel manufacturer. Sealant shall be an extrudable non-drying, non-skidding synthetic elastomer material.
4. Finish: Exterior finish of roof and fascia panels and trim pieces for the metal roofing system shall be a fluoropolymer Kynar 500 coating, minimum of 1 mil nominal thickness. Color will be selected by the Architect.

D. Roof Panel Penetrations:

1. Plumbing vents and stacks shall be extended through new metal roofing panels and flashed with new EPDM flashing to make for watertight installation.
2. Flashing for exhaust fan curbs and for any penetrations shall be as per manufacturer's details for flashing.

E. Sealants:

1. Closer Strips: The corrugations of the roof and wall panels shall be filled with solid or closed cell, preformed, rubber or neoprene closures along with eave ridge and rake when required for weather-tightness.
2. Sealer: All roof panels side laps and end laps shall be sealed with 3/16" diameter mastic. The sealer shall be a gray elastic compound of synthetic base and fibrous filler and shall have good adhesion to metal. The material shall be non-staining, non-corrosive, non-shrinking, non-oxidizing, non-toxic and non-volatile. The service temperature will be from -30° F to -200° F and the flash point must be above 400° F. The material shall meet or surpass the requirements of Specification Mil-C-18969B, Type II, Class B, and shall be equal to that manufactured by Presstite Division of Interchemical Corporation.
3. Gutter Sealer: All gutter joints shall be sealed with aluminum pigmented 3M Gutter Seal or equal.

F. Fascia Panel Installation: As shown on the drawings and noted above the roof panels shall be constructed at eave so that ribs of fascia panels are in line with roof panels.

7-05. FINISHES:

- A. Roof and Fascia Panels: Finish with corrosion - resistant metallic coating, Kynar 500, 1 mil ( .001") thick, factory applied prior to fabrication. Color to be selected by the Architect.
- B. Samples of roof and wall panel colors to be submitted for color selection.

7A-06. FASTENINGS:

All fastenings shall be of the type, length and spacing that will secure the framing and support members directly into the existing and/or new structural system and as recommended by the metal building panel manufacturer. **Fastenings shall be of stainless steel.**

The contractor shall submit, to the Architect prior to starting any work, a complete list of the fastenings he proposes to use for each framing system, showing by size, type, and spacing, etc. joist structural system. Metal roof panels applied over this system shall have fasteners penetrating either the steel joist or through the heavy- duty steel decking. See roof deck systems section, these specifications, for deck system.

7A-07. MISCELLANEOUS:

- A. Ridge Vent: Where shown, furnish and install continuous gravity type ridge vent as detailed. Sheet metal parts shall be of 22 gauge. Finish and color to be same as roof panels.
- B. Drip and Trim Pieces: To be in shapes, sizes and gauges as shown on the drawings. All metal for trim pieces to be minimum 24 gauge, in same finish and color as roof

panels where panels are called for with color finish. Where galvalume finish is called for, drip and trim gutter and downspout to be painted color as selected by Architect. Drip shall be installed as detailed with continuous cleat and joints shall be butted and 4" wide joint covers installed over using same material, gauge, finish, etc.

- C. Curbs: This contractor is to furnish and install all roof curbs that are required for Mechanical roof mounted exhaust fans air intake hoods, and gravity vents that penetrate this metal roof. Fan and air intake hood dimensions will be provided by the mechanical contractor. Gravity vents will be furnished by the general contractor.

7A-08. GUTTERS AND DOWNSPOUTS:

- A. Where shown on the drawings, furnish and install gutters and downspouts. Gutters and downspouts will be constructed in shapes and sizes as detailed and of 24-gauge steel. Finish shall be Kynar 500 finish in color selection from PEMB System manufacturer's standard colors.
- B. Downspouts terminate will terminate into a downspout elbow diverter as required to divert roof water away from building.
- C. All workmanship shall be first class. Gutters and downspouts shall be straight and true and all components shall be properly anchored.
- D. Anchorage for downspouts to building wall shall be as shown and detailed on the drawings.

7A-09. UNDERLAYMENT:

Roofing Underlayment shall be a 40-mil thick, peel and stick, SBS (Styrene butidyene styrene) modified, rubberized asphalt sheet waterproofing underlayment equal to Grace Ice and Watershield or Loadmaster Duraclad underlayment as manufactured by Grace Construction Products. With an internally reinforced non-woven polyester fabric. Roofing Underlayment shall have a white reflective topping for added foot safety as well as heat reduction on the deck and protection against short term. Ultra violet damage. A removable release film shall be on the membrane under side for ease of application.

7A-10. METAL CORRUGATED SIDING PANELS: N.A.

7A-11. FORMED METAL WALL PANELS: N.A.

7A-12. ROOF INSULATION:

Insulation shall be 3" thick, R-19 glass fiber reinforced closed cell polyisocyanurate foam core board with impermeable facers. Insulation shall be equal to NRG E'NERG"Y 2 as manufactured by NRG Barriers, Inc., Saco, Maine. Insulation shall have LTTR ratings (Long Term Resistance Values).

Insulation fasteners shall be as required and approved by membrane manufacturer for mechanically fastened single-ply system and by metal roof panel manufacturer for concealed fastened metal roof panels. Screw and plate fasteners in lengths as required to penetrate new steel deck. Pattern and number of fasteners as required by roof membrane manufacturer and by metal roof manufacturers.

Installation of insulation shall be in strict accordance to insulation manufacturer's recommendations and standard installation procedures including types of fasteners, fastening pattern, installation pattern, edge treatment and joint treatment.

Installation of roof insulation shall be by roofing subcontractor and fastening system shall in no way diminish ability of roof system to comply with specified wind speeds. See Section 6 and Section 7 of these specifications.

7A-13.            DESIGN REQUIREMENTS:

Design for the metal roofing system, metal wall system and corrugated metal siding panels shall be for an ultimate wind speed of 160 mph as per ASCE 7-10 and the State of Florida Building Code 2023.

Shop drawings shall be signed, dated and sealed by a Florida Registered Engineer, and it shall be stated by the Engineer that the system will comply with the uplift requirements as state herein.

**Metal roofing, wall and siding systems shall contain product approval numbers and information showing product complies with the Florida Building Code 2023, Section 17. See Supplementary and Special Conditions, Paragraph 15-6**

7A-14.            GUARANTEES AND ONE YEAR INSPECTION:

A.        The following guarantees shall be furnished to the Owner at completion of project, dated the Date of Acceptance, for each Metal Roof System.

1.        Manufacturer's Warranty: Warranting the finish of the panels against blistering, peeling, cracking, or chipping and also against significant color change, for a period of Twenty (20-Yrs.) Years.
2.        Manufacturer's Twenty (20 Yr.) Year Warranty: For weather tightness of the total metal roofing system, both classroom building and pavilion.

If not implied or stated on this Warranty, the Roofing Contractor shall furnish separate Guarantee in writing, to the Owner, his Workmanship and Materials Guarantee, guaranteeing the weather tightness of his work for a period of three (3) years, from Date of Acceptance.

B.        Manufacturer's One Year Inspection: The roof shall be inspected by the manufacturer's representative within one year of the project's completion and acceptance of the Board.

**END OF SECTION**

## SECTION 7C

### WATERPROOFING, DAMPPROOFING, AND CAULKING

#### 7C-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this section as if written in full herein.

#### 7C-02. SCOPE:

The contractor shall furnish all labor and materials for waterproofing, damp proofing and caulking indicated on the drawings, as specified, and here reasonably required to make work watertight.

#### 7C-03. WORK BY OTHERS:

All admix or liquid waterproofing of masonry and all sheet metal, water or damp proofing will be done by the respective sub-contractors.

#### 7C-04. WALL FLASHING:

Exterior masonry walls shall be dampproofed with fabric flashing installed at mortar "cant", over top of foundation walls, over window heads, glazed panels, and openings, as indicated on drawings or required to provide such protection. "Fabric Flashing" in the above locations shall be Type A-3 oz. flashing as manufactured by AFCO Products, Inc., or Nervastral 56 as manufactured by Nervastral Waterproofing Products.

The flashing shall be in long lengths lapped 4" at all joints and sealed watertight. At heads and sills, **extend 8" beyond jamb line** and turn up with folded corner to lead all moisture to the exterior.

All metal flashing and counter flashing shall be as indicated on drawings and as specified under "Roofing and Sheet Metal Work".

#### 7C-05. EXTERIOR WALL WATERPROOFING: N.A.

#### 7C-06. FLOOR SLAB WATERPROOFING: (vapor barrier)

Under all interior floor slabs, install one layer of .010 "Natural Visqueen" or equal over carefully prepared porous fill by a suitable method to prevent damage or rupturing of film. Lap all joints 8" with the top lap in the direction of the spreading of the concrete. Cut carefully around all pipes, conduits, etc., and apply pressure-sensitive tape to all joints to ensure maximum barrier effectiveness as the manufacturer recommends. Turn up at exterior walls to ensure enveloping and trim after the concrete pour. Inspect all surfaces after the mesh is laid and repair all damage.

7C-07. METAL ROOF UNDERLAYMENT:

Roofing Underlayment shall be a 40-mil thick, peel and stick, SBS (Styrene butadiene styrene) modified, rubberized asphalt sheet waterproofing underlayment equal to Grace Ice and Watershield or Loadmaster Duraclad underlayment as manufactured by Grace Construction Products. With an internally reinforced non-woven polyester fabric. Roofing Underlayment shall have a white reflective topping for added foot safety as well as heat reduction on the deck and protection against short term. Ultra violet damage. A removable release film shall be on the membrane under side for ease of application.

7C-08. CAULKING:

- A. Scope: Caulk all joints between masonry and the perimeter of exterior door and window frames and similar locations in exterior walls of building wherever **indicated or specified or necessary to make weather tight.**
- B. Materials: Caulking compound shall be Dow Corning 785 Silicone Building Sealant, or G.E. Construction 1200 Sealant. Substitutes other than these are acceptable with approval by the Architect prior to being shipped to the work.
- C. Caulking: Joints and spaces shall be thoroughly clean and dry.

Caulking around frames of exterior openings and as may be required in masonry shall be not less than 1/2" deep and joints shall be raked clean and prepared to receive the compound and shall be filled. Finish joints smoothly and slightly concave.

Caulking around windows in areas where special concrete coating is to be applied shall be done prior to concrete coating. Caulking shall be left slightly recessed.

Joints having depth more than 3/4" shall be packed with oakum to within 1/2" of the surface and carefully and filled with compound and thoroughly worked in. Material shall finish neatly against adjoining surfaces, smooth and of uniform width.

The method of application will be by means of a pressure caulking gun; in locations where a caulking gun cannot be used, the compound shall be applied with hand caulking tools.

The color of caulking shall be as selected by Architect.

Metal Thresholds: Unless otherwise specifically indicated on drawings, shall be set in full beds of caulking compound.

7C-09. THRESHOLDS AND WEATHER STRIPPING:

Covered in Finish Hardware Section, these specifications.

**END OF SECTION.**

## SECTION 8A

### GLASS, GLAZING, AND STOREFRONT

#### 8A-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

#### 8A-02. SCOPE:

Furnish all labor, materials, and equipment and perform all operations necessary for the complete installation of all glass, glazing, windows, and store front as noted in these specifications and as shown on the drawings.

#### 8A-03. GLAZING:

All glazing shall be done by experienced glaziers. Only high grade glazing compound shall be used. G.E. Silglaze 2400 Silicone Sealant. All surfaces to be glazed shall be clean and dry and no glazing shall be done in freezing weather. Face putty shall be smooth and of uniform width, without ripples and all corners shall be cut clean and sharp.

Rebates of glazed panels and doors shall be primed before installing glass and all glass shall be back puttied and bedded on all sides except as noted for plate glass. Heat absorbing glass shall be set as to allow free expansion and contraction of the material.

Each piece of glass shall bear the manufacturer's label of quality and the labels shall remain in place until after inspection and approval of Architect. After inspection and approval, the labels shall be removed and glass cleaned and polished, both sides.

#### 8A-04. SAFETY STANDARDS:

All glazing shall comply with Safety Standards for Architectural Glazing 16CFR as issued by the Consumer Safety Commission. **All windows shall meet requirements for 130 mph ultimate wind speed as per the 2014 Florida Building Code and ASCE 7-10.**

#### 8A-05. NON-SECURITY LEVEL GLASS:

### **PART 1 -GENERAL**

#### 1.1 SECTION INCLUDES

A. Glass and glazing units for the following products and applications, and glazing requirements referenced by other sections:

1. Windows.
2. Doors.
3. Interior borrowed lites.
4. Glazed entrances.
5. Storefront framing.

6. Glazed curtain walls.
7. Skylights.

B. Glazing accessories.

1.2 RELATED SECTIONS

- A. Division 08 Section 'Decorative Glass Glazing.'
- B. Division 08 Section 'Mirrors.'
- C. Division 08 Section 'Plastic Glazing.'
- D. Division 08 Section 'Security Glazing.'

1.3 REFERENCES

- A. American Architectural Manufacturers Association:
  1. AAMA 800 - Voluntary Specifications and Test Methods for Sealants.
- B. ASTM International (ASTM):
  1. **ASTM C 509** - Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
  2. **ASTM C 864** - Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
  3. **ASTM C 920** - Specification for Elastomeric Joint Sealants.
  4. **ASTM C 1036** - Specification for Flat Glass.
  5. **ASTM C 1048** - Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
  6. **ASTM C 1087** - Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.
  7. **ASTM C 1115** - Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories.
  8. **ASTM C 1172** - Specification for Laminated Architectural Flat Glass.
  9. **ASTM C 1281** - Specification for Preformed Tape Sealants for Glazing Applications.
  10. **ASTM C 1330** - Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
  11. **ASTM C 1376** - Specification for Pyrolytic and Vacuum Deposition Coatings on Glass.
  12. **ASTM E 774** - Specification for the Classification of the Durability of Sealed Insulating Glass Units.
  13. **ASTM E 1300** - Practice for Determining Load Resistance of Glass in Buildings.
  14. **ASTM E 2190** - Standard Specification for Insulating Glass Unit Performance and Evaluation.
- C. Code of Federal Regulations:
  1. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials.
- D. Glass Association of North America (GANA):
  1. Glazing Manual.
  2. Laminated Glass Design Guide.
  3. Engineering Standards Manual.
- E. The Insulating Glass Manufacturers Alliance (IGMA):
  1. IGMA TB-3001 - Sloped Glazing Guidelines.
  2. IGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units.
- F. Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; Building Technologies Department; Windows & Daylighting Group, [windows.lbl.gov/software](http://windows.lbl.gov/software):

1. **"LBNL Window 5.0 (or higher) - A PC Program for Analyzing Window Thermal and Optical Performance.**

G. National Fenestration Rating Council (NFRC):

1. NFRC 100 - Procedure for Determining Fenestration Product Thermal Properties.
2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence.
3. NFRC 300 - Procedures for Determining Solar Optical Properties of Simple Fenestration Products.

H. National Fire Protection Association (NFPA):

1. NFPA 80 - Fire Doors and Windows.
2. NFPA 252 - Fire Tests of Door Assemblies.
3. NFPA 257 - Fire Test for Window and Glass Block Assemblies.

1.4 DEFINITIONS

A. Manufacturers of Primary Glass: Firms that produce primary glass, as defined in referenced industry publications.

B. Manufacturers/Fabricators of Glass Products: Firms that utilize primary glass in the production of glass products that may include coated glass, laminated glass, and insulating glass.

C. Sealed Insulating Glass Unit Surfaces:

1. Surface 1: Exterior surface of outer lite.
2. Surface 2: Interspace-facing surface of outer lite.
3. Surface 3: Interspace-facing surface of inner lite.
4. Surface 4: Interior surface of inner lite.

1.5 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems that will withstand indicated loads and normal thermal movement without failure, including loss or glass breakage resulting from defective manufacture, fabrication, or installation; failure of glazing systems to remain watertight and airtight; or deterioration of glazing materials.

B. Glass Design: Glass thicknesses indicated are minimums. Select actual glass lite thicknesses by analyzing loads and conditions. Provide glass lites in the thicknesses and in strengths required to meet or exceed the following criteria:

1. Glass Thicknesses: Comply with ASTM E 1300, as follows:
  - a. Specified Design Wind Loads: As indicated.
  - b. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set within 15 degrees of vertical and under wind load for a load duration of [3] seconds.
  - c. Probability of Breakage for Sloped Glazing: 1 lite per 1000 for lites set more than 15 degrees off vertical and under wind and snow loads for a duration of [30] days.
  - d. Thickness of Tinted Glass: Provide the same thickness for each tint color for all applications.

C. Thermal Movements: Allow for thermal movements of glazing components and glass framing members resulting from a temperature change range of 120 deg F ambient and 180 deg F material surfaces.

D. Thermal and Optical Performance Properties: Provide glass meeting specified performance properties, based on manufacturer's published test data for units of thickness indicated, and the following:

1. Center-of-Glass Values: Per LBNL Window 5.0 (or higher) analysis, as follows:
  - a. U-Factors: NFRC 100 expressed as Btu/sq. ft. x h x deg F.

- b. Solar Heat Gain Coefficient: NFRC 200.
- c. Solar Optical Properties: NFRC 300.

## 1.6 SUBMITTALS

- A. Product Data: Manufacturer's data sheets for each glass product and glazing material.
- B. Samples: 12-inch-square, for each type of glass product, other than monolithic clear float glass [or clear float glass only set in insulated glass units].
- C. Glazing Schedule: Prepare schedule using designations used on Drawings.
- D. Product Certificates: Signed by manufacturers/fabricators of glass products certifying that products furnished comply with project requirements.
- E. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer, based on submitted samples or acceptable data from previous testing of current formulations with similar products.
- F. Qualification Information: For Installer firm and Installer's manufacturer/fabricator-trained field supervisor.
- G. Warranties: Submit sample meeting warranties requirements of this Section.

## 1.7 QUALITY ASSURANCE

- A. Manufacturer/Source: Obtain each type of glass product from a single primary glass manufacturer and a single manufacturer/fabricator for each glass product type.
  - 1. For glass sputter-coated with solar-control low-e coatings, obtain glass products in fabricated units from a manufacturer/fabricator certified by the primary glass manufacturer.
- B. Installer Qualifications: Experienced Installer with minimum of 5 successful completed projects of similar materials and scope, approved by glass product manufacturer/fabricator.
- C. Preconstruction Adhesion and Compatibility Testing: Submit glass units, glazing materials, and glass-framing members with applicable finish to elastomeric glazing sealant manufacturer for determination of sealant compatibility, priming, and preparation requirements for optimum adhesion and performance.
- D. Glazing for Fire-Rated Door and Window Assemblies: Glazing tested per NFPA 252 and NFPA 257, as applicable, for assemblies complying with NFPA 80 and listed and labeled per requirements of authorities having jurisdiction.
- E. Safety Glazing Products: Comply with size, glazing type, location, and testing requirements of 16 CFR 1201 for Category I and II glazing products, and requirements of authorities having jurisdiction.
- F. Glazing Industry Publications: Comply with glass product manufacturers' recommendations and the following:
  - 1. GANA Publications: GANA Laminated Division's 'Laminated Glass Design Guide' and GANA's 'Glazing Manual.'
  - 2. IGMA Publication for Insulating Glass: IGMA TM-3000, 'Glazing Guidelines for Sealed Insulating Glass Units.'
- G. Insulating-Glass Certification Program: Indicate compliance with requirements of Insulating Glass Certification Council on applicable glazing products.
- H. Mockups: Prior to installing glazing, build mockups to demonstrate materials and workmanship. Coordinate with mockup requirements of related sections.

- I. Preinstallation Conference: Conduct conference at Project site in compliance with Division 01 requirements.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials during shipping, handling, and storage to prevent breakage, scratching, damage to seals, or other visible damage. Deliver, unload, store, and erect glazing materials without exposing panels to damage from construction operations.
  - 1. Comply with manufacturer's venting and sealing recommendations for shipping and handling of insulating glass units exposed to substantial altitude change.

## 1.9 WARRANTY

- A. Warranty for Coated-Glass Products: Manufacturer's standard form, signed by coated-glass product primary manufacturer or manufacturer/fabricator, as applicable, agreeing to replace coated-glass units that display peeling, cracking, and other deterioration in metallic coating under normal use, within [10] years of date of Substantial Completion.
- B. Warranty for Laminated Glass: Manufacturer's standard form, signed by laminated-glass product manufacturer/fabricator, agreeing to replace laminated-glass units that display edge separation, delamination, and blemishes exceeding those allowed by ASTM C 1172, within [five] years of date of Substantial Completion.
- C. Warranty for Insulating Glass: Manufacturer's standard form, signed by insulating-glass product manufacturer/fabricator, agreeing to replace insulating-glass units that exhibit failure of hermetic seal under normal use evidenced by the obstruction of vision by dust, moisture, or film on interior surfaces of glass, within [10] years of date of Substantial Completion.
- D. Installer's Warranty: Form acceptable to Owner, signed by glass product Installer, agreeing to replace glass products that deteriorate, or that exhibit damage or deterioration of glass or glazing products due to faulty installation, within [2] years of date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis of Design: Glass product selections are based upon the primary glass manufacturer below. Provide basis of design product [, or comparable product of a listed manufacturer approved by the Architect prior to bid]:
  - 1. Vitro Architectural Glass, Cheswick, PA, (888) 774-4332, Email: [ideascapescapes@ppg.com](mailto:ideascapescapes@ppg.com), <http://www.vitroglazings.com>.

### 2.2 GLASS PRODUCTS

**General – All exterior glazed glass units, including glass at store front windows, doors and curtain wall shall be insulating units with overall thickness of 1 5/16” consisting of an out lite of 9/16” laminated glazing and an interior lite of ¼” heat treated / heat strengthened float glass glazing. The laminated glazing shall consist of 2 layers of glass glazing with an interlayer of .090 P.V.B. (poly vinyl butyral)**

- A. Annealed Float Glass, General: ASTM C 1036, Type I, Quality-Q3, class indicated.
- B. Annealed Ultra-Clear (Low Iron) Float Glass: Class I (clear).
  - 1. Basis of Design Product: Vitro Architectural Glass, Starphire.
  - 2. [Specifier: insert manufacturer of comparable product if required]

- C. Heat-Treated Float Glass, Heat-Strengthened: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; Kind HS, of class and condition indicated: where indicated, where needed to resist thermal stresses and where required to comply with performance requirements.
- D. Heat-Treated Float Glass, Fully Tempered: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; Kind FT, of class and condition indicated: where safety glass is indicated. Safety glazing must comply with ANSI Z97.1 and CPSC 16CFR-1201.
- E. Laminated Glass: ASTM C 1172, with manufacturer's .090 polyvinyl butyral or cured resin interlayer.
- F. Insulating-Glass Units: Factory-assembled units consisting of dual-sealed lites of glass separated by a dehydrated interspace, with manufacturer's standard spacer material and construction, per ASTM E 2190.

### 2.3 GLAZING ACCESSORIES

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Glazing Tape: Butyl-based elastomeric tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for specified installation, complying with ASTM C 1281 and AAMA 800 for application.
- C. Glazing Tape: Closed cell polyvinyl chloride foam, maximum water absorption by volume 2 percent, designed for 25 percent compression percent for air barrier and vapor retarder seal, black color, coiled on release paper over adhesive on two sides; widths required for specified installation, and complying with AAMA 800.
- D. Glazing Gaskets:
  - 1. Dense Compression Gaskets: ASTM C 864, neoprene or EPDM, or ASTM C 1115, silicone, or thermoplastic polyolefin rubber, as recommended by glazing product manufacturer for application, molded or extruded shape to fit glazing channel retaining slot; black color.
  - 2. Soft Compression Gaskets: ASTM C 509, Type II, black, molded, or extruded, neoprene, EPDM, silicone, or thermoplastic polyolefin rubber, of profile and hardness required to maintain watertight seal.
- E. Setting Blocks: ASTM C 864, neoprene, 80 to 90 Shore A durometer hardness; length 4 inches, width of glazing rabbet space less 1/16-inch, height required for glazing method, pane weight, and pane area.
- F. Spacer Shims: ASTM C 864, neoprene, 50 to 60 Shore A durometer hardness; length 3 inches, one half height of glazing stop, thickness required for application, one face self-adhesive.
- G. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- H. Glazing Sealants: ASTM C 920, type recommended by glazing product manufacturer for application indicated, complying with requirements of Division 07 Section 'Joint Sealants,' color as selected by Architect.
- I. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- J. Smoke Removal Unit Targets: Adhesive targets for application to glass, identifying glass units designed for removal for smoke control.

## 2.4 FABRICATION OF GLAZING UNITS, GENERAL

- A. Fabricate glazing units in dimensions required, with edge and face clearances, edge and surface conditions, and bite in accordance with glazing product manufacturer/fabricator's instructions and referenced glazing publications.

## 2.5 INSULATING-GLASS UNIT(S)

- A. Double Glazed Tinted Solar Control Insulating Glass Unit [Solarban® 60 on Solargray® 6mm (2) | Air 1/2" (12.7mm) | Clear 6mm]
  - 1. Conformance: ASTM E 2190
  - 2. Outdoor Lite: Solargray® Tinted Float Glass as manufactured by Vitro Architectural Glass
    - a. Conformance: ASTM C 1036, Type 1, Class 2, Quality q3.
    - b. Glass Thickness: 6mm (1/4")
    - c. Magnetic Sputter Vacuum Deposition Coating (MSVD): ASTM C 1376.
    - d. Coating: Solarban® 60 on Surface # 2
    - e. Heat-Treatment: Heat-strengthened, ASTM C 1048, Kind HS
  - 3. Interspace Content: Air 1/2" (12.7mm)
  - 4. Indoor Lite: Clear float glass as manufactured by Vitro Architectural Glass
    - a. Conformance: ASTM C 1036, Type 1, Class 1, Quality q3.
    - b. Heat-Treatment: Heat-strengthened, ASTM C 1048, Kind HS
    - c. Glass Thickness: 6mm (1/4")
  - 5. Performance Requirements:
    - a. Visible Light Transmittance: 35 percent minimum.
    - b. Winter Nighttime U-Factor: 1.55 (W/m<sup>2</sup>\*°C) maximum.
    - c. Summer daytime U-Factor: 1.55 (W/m<sup>2</sup>\*°C) maximum.
    - d. Shading Coefficient: 0.29 maximum.
    - e. Solar Heat Gain Coefficient: 0.25 maximum.
    - f. Outdoor Visible Light Reflectance: 6 percent maximum.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that glazing channels are clean and ready to accept glazing installation, and that weeps are unobstructed. Confirm that minimum required face and edge clearances will be maintained. Do not proceed with glazing until unsatisfactory conditions have been corrected.
- B. Examine glazing units prior to setting. Reject units that display edge or face damage that may impede performance of unit or that will be visible when installed.

### 3.2 PREPARATION

- A. Clean glazing channels with recommended solvent and wipe dry. Apply primers to joint surfaces to ensure adhesion of sealants, unless preconstruction sealant-substrate testing indicates no primer is required.

### 3.3 GLAZING INSTALLATION

- A. General: Install glass and glazing materials in accordance with instructions of manufacturers and requirements of GANA Glazing Manual.
  - 1. Install setting blocks of size and in location required by glass manufacturer. Set blocks in bed of approved sealant.
  - 2. Provide spacers for glass lites as recommended, based upon size of glass unit.
  - 3. Comply with glass manufacturer's limits on edge pressures.

4. Ensure that glazing units are set with proper and consistent orientation of glass units toward interior and exterior.
  5. Provide edge blocking where recommended.
  6. Install sealants in accordance with requirements of Division 07 Section 'Joint Sealants.'
- B. Tape Glazing: Place tapes on fixed stops positioned to be flush or protrude slightly when compressed by glass. Install tapes continuously. Form butt joints at corners and where required, and seal tape joints with approved sealant.
1. Apply heel bead of glazing sealant along intersection of permanent stop and frame for continuity of air and vapor seal.
  2. Set glass lites centered in openings on setting blocks.
  3. Install removable stops, and insert dense compression gaskets at corners, working toward centers of lites, compressing glass against tape on fixed stops.
  4. Apply cap bead of elastomeric sealant over exposed edge of tape or gasket on exterior of glass unit.
- C. Sealant Glazing: Install continuous spacers between glass lites and glazing stops. Install cylindrical sealant backing where recommended, in width and depth recommended to provide proper depth and width of sealant bead. Ensure sealant cannot block weep system.
1. Install sealant under pressure to completely fill glazing channel without voids, with full bond to glass and channel surfaces.
  2. Tool sealant bead to proper profile providing wash away from glass.
- D. Sealant Glazing for Butt Glazing:
1. Brace glass in position for duration of glazing process
  2. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
  3. Secure small diameter non-adhering foamed rod on back side of joint.
  4. Apply sealant to open side of joint in continuous operation; completely fill joint without displacing foam rod; tool sealant surface smooth to concave profile.
  5. Allow sealant to cure, then remove foam backer rod.
  6. Apply sealant to opposite side; tool sealant smooth to concave profile.
  7. Remove masking tape.
- E. Gasket Glazing: Fabricate gaskets to fit openings exactly. Allow for stretching of gaskets during installation.
1. Set soft compression gasket against fixed stop or frame, secure, with bonded miter cut joints at corners.
  2. Set glass lites centered in openings on setting blocks.
  3. Install removable stops, and insert dense compression gaskets at corners, working toward centers of lites, compressing glass against soft compression gaskets and to produce a weathertight seal. Seal joints in gaskets. Allow gaskets to protrude past face of glazing stops.

### 3.4 CLEANING AND PROTECTION

- A Protect installed glass from damage. Attach streamers or warning tape to framing members, away from contact with glass. Remove nonpermanent labels.
- B Protect glass from contact with contaminating substances during construction. Immediately clean glass exposed to contamination using methods recommended by glass manufacturer.
- C Within 5 working days prior to inspection for Substantial Completion, clean all exposed glass surfaces using methods recommended by manufacturer. Remove glazing compounds from framing surfaces.
- D Remove and replace broken or damaged glass.

8A-06. SOLID VINYL WINDOWS: N.A.

8A-07. ALUMINUM STOREFRONT AND SASH:

- A General: All aluminum tubing shown for fixed glass windows and windows shall be equal to Kawneer TriFab II 451 UT Series, 2" x 4 ½" or Vista Wall Series 3000 2" x 4 ½". Finish shall be Class 1 – clear anodized. Aluminum storefront shall be for Thermopane glazing.
- B Materials: All framing members shall be extruded aluminum of 6063-T6 alloy and temper. Exterior glazing gasket shall be E.P.D.M. and interior glazing seal shall be closed cell PVC. foam sealant tape. All mullions and horizontals for 1" glazing (except butt glazed) shall be thermally isolated from the pressure plate by a rigid vinyl separator.
- C Installation: All openings shall be prepared plumb and square by others and shall be of sufficient size to provide clearance at jambs, head and sill as shown on the Architectural drawings. Experienced technicians shall perform installation, glass and glazing according to the manufacturer's recommended procedures. All units shall be securely anchored with all joints fully caulked to issue a water tight seal. Sills shall be laid in full bed of caulking and jambs and heads shall be caulked as shown on the drawings and specified elsewhere in these specifications. Installation shall be by skilled, well trained mechanics. Fastenings shall be Phillips Head Machine Screws counter sunk and of stainless steel.
- D Finish: All exposed surfaces shall be free of unsightly scratches and blemishes. The exposed surfaces shall receive a caustic etch followed by an architectural class I clear anodized coating conforming to AA-M12C22A44 Vistawall 740-EC.
- E Cleaning: Upon completion of construction, the General Contractor shall be responsible for cleaning all aluminum, employing methods recommended by the manufacturer as follows Anodized aluminum shall be cleaned with plain water containing a mild detergent, or a petroleum product such as white gasoline, kerosene, or distillate. No abrasive agent shall be used.
- F Florida Product Approval Number: **FL 10008.1**
- G Warranty: Provide standard limited two-year warranty from the date of substantial completion.
- H See drawings for locations for store front and fixed glass windows.

8A-08. ALUMINUM FRAME ENTRANCE DOORS:

- A. General: All aluminum entrances shall be series 500 wide stile door as manufactured by Vistawall Architectural products or series 500 Door as manufactured by Kawneer Company.
- Doors and storefront systems to be of same manufacturer.
- B. Materials: All door and framing sections shall be of extruded aluminum alloy and temper to meet or exceed finishing and structural criteria as specified. Door stiles and rails, excluding glass stops, shall be tubular and have .125 wall thickness. All weathering shall be a hardbacked silicone treated polypropylene. Any exposed fasteners shall be aluminum, stainless steel or other non-corrosive material.

- C. Finish: All exposed surfaces shall be free of unsightly scratches and blemishes. The exposed sections shall receive a caustic etch followed by class I clear anodized finish.
- D. Construction and Design: Door stiles and rails shall be accurately joined at corners with heavy concealed reinforcement brackets secured with bolts and screws, and shall be MIG welded. Doors shall have snap-in stops with bulb glazing vinyl on both sides of the glass. No exposed screws shall be permitted. Each door leaf shall be equipped with an adjusting mechanism located in the top rail near the lock stile which provides for minor clearance adjustments after installation. Weathering shall be installed in the hinge stiles of pairs or single center hung doors. The lock stile of a single center hung door, active meeting stile at a pair of butt hung, offset pivot, or center hung doors shall have an adjustable astragal weather-strip. Pile sweep strip shall be applied to bottom rail of doors.

Door frame and sidelight framing shall be accurately joined at corners with unexposed screws. All glazing shall be flush, including the horizontal muntin and sills and held in place by E.P.D.M. glazing gaskets on both sides. No applied stops shall be permitted except at the transom bar of center hung doors. All butt-hung and offset pivot door frames shall have door stops at jambs and head with continuous weathering. tops on exterior side shall be lock in tamper proof type.

- E. Hardware: All doors shall be equipped with concealed closer in transom with back check. Operating hardware shall be offset pivot. Doors to be furnished with Kawneer C-90 paneline exit device and style "U" pull or Vistawall inline panic device and PH-5 pull. Furnish with 4" aluminum saddle threshold and install in full bed of mastic. Cylinder lock to be furnished under Hardware Section, these specifications.
- F. Erection: All openings shall be prepared plumb and square by others and shall be of sufficient size to provide clearance at jambs, head and sill as shown on the Architectural drawings. Installation, glass and glazing shall be performed by experienced technicians according to the manufacturer's recommended procedures. All units shall be securely anchored with all joints fully caulked to insure a water tight seal.
- G. Protection and Cleaning: After installation, the General Contractor shall adequately protect exposed portions of the aluminum entrance work from damage by grinding and polishing compounds, plaster, lime, acid, cement or other contaminants.

Upon completion of construction, the general contractor shall be responsible for cleaning all aluminum, employing methods recommended by the manufacturer as follows: Anodized aluminum shall be cleaned with plain water containing a mild detergent, or a petroleum product such as white gasoline, kerosene or distillate. No abrasive agent shall be used.

- H. Warranty: Provide standard limited two-year warranty from the date of substantial completion.

8A-09. ALUMINUM WINDOWS N.A.

8A-10. SKYLIGHTS: N.A.

8A-11.        SHOP DRAWINGS:

Glass and glazing contractor shall furnish complete shop drawings for all items this Section for approval prior to fabrication showing all details, sizes, shapes, dimensions, etc.

**Shop Drawings shall show calculations, signed and sealed by an engineer registered in the State of Florida, that all exterior glazing, windows and store front comply with 160 mph ultimate wind speed as per the 2023 Florida Building Code and ASCE 7-10.**

**Shop Drawings shall also include product approval number and additional test data that is required to comply with the 2023 Florida Building Code. See Supplementary and Special Conditions, Paragraph 15-6.**

8A-12.        CLEANING:

After Final Inspection, all remaining glazing compound and smears shall be cleaned from the glass, the sash and frames, and the glass washed clean. Broken glass shall be removed and replaced at no expense to the Owner.

8A-13        GLAZED ALUMINUM CURTAIN WALLS: N.A.

**END OF SECTION.**

**SECTION 8B  
EXTERIOR AND INTERIOR DOORS**

8B-01.        GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

8B-02.        SCOPE:

Furnish all labor, materials, and equipment and perform all operations necessary for the complete installation of all glass, glazing, windows, and store front as noted in these specifications and as shown on the drawings.

8B-03.        MOTOR OPERATED SERVICE DOOR: N.A.

8B-04.        HOLLOW METAL DOORS:                    **SEE SECTION 8C**

8B-05        WOOD DOORS:

All wood doors shall be sized as scheduled on the drawings and shall be equal to the following specifications for door types.

- A.    Hollow Core Doors: Shall be Graham seven-ply hollow core doors, 1-3/4" thick conforming to US Commercial Standard CS 171-58, including all amendments. Type I waterproof glue for exterior doors and Type II water resistant for interior doors. Hollow core doors shall be flush panel, Birch Veneer. Furnish one-year industry guarantee.
- B.    Solid Core Doors: Shall be Graham exterior or interior solid lumber staved core doors, 1- 3/4 " thick, of sizes as noted on drawings. Doors noted for 20-minute rating shall be DGS-20 staved core. Doors shall conform to U.S.

Commercial Standard CS 171-58 including all amendments. Face veneer shall be Birch premium grade. Exterior doors shall be guaranteed for two (2) years after installation, interior doors for life of installation. Top and bottom edges to be at least 2 \_" minimum hardwood, side edges to be 1 3/4" minimum Beech.

- C.    Fire Doors: Where noted on the drawings, rated or label wood doors shall be equal to Weyerhaeuser staved core DFM-60 fire door for a one-hour fire rating, conforming to industry standards I.S. 1-73. Door shall carry appropriate UL Label. Finish shall be Birch premium grade.
- D.    Acceptable manufacturers are US Plywood, Roddis, or Eggers Hardwood Company; supplier to furnish submittal data showing all specifications of doors to be furnished for approval by Architect.

8B-06.        METAL GLASS STOPS:

All wood doors shown or noted with glass lights shall have metal stops. Stops shall be Type FGS75 for

single glazing and shall be as manufactured by Anemostat Door Products. **Install stops with stainless steel through bolts.**

8B- 07.        ALUMINUM FRAME ENTRANCE DOORS: See Section 8A-08.

8B-08.        BULLET RESISTANT WOOD DOORS: N.A.

8B-09.        PUSH UP COUNTER DOOR: N.A.

**8B-10.        PRODUCT APPROVAL NUMBERS: (METAL DOORS AND FRAMES)**

Submittals for exterior hollow metal doors, metal door frames, exterior roll up doors, and exterior hollow metal window frames to have Florida Product Approval Numbers and information showing product complies with the Florida Building Code 2014. See Supplementary and Special Conditions, Paragraph 15-6 for this requirement.

Approval numbers shall be for the entire assembly (frames, doors, and hardware), including gauges of materials, setbacks of hardware anchorage, and installation of all components.

**END OF SECTION**

## SECTION 08C

### HOLLOW METAL DOORS AND FRAMES

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### 1.2 SUMMARY

###### A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

###### B. Related Sections:

1. Division 01 Section "General Conditions".
2. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
3. Division 08 Section "Flush Wood Doors".
4. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
5. Division 08 Section "Door Hardware".
6. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.
7. Division 28 Section "Access Control Hardware".

###### C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies.
7. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
8. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
9. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

10. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
11. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
12. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
13. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
14. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
15. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
16. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
17. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
  1. Elevations of each door design.
  2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
  3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
  4. Locations of reinforcement and preparations for hardware.
  5. Details of anchorages, joints, field splices, and connections.
  6. Details of accessories.
  7. Details of moldings, removable stops, and glazing.
  8. Details of conduit and preparations for power, signal, and control systems.
- D. Samples for Verification:
  1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.
- E. Informational Submittals:
  1. Hurricane Resistant Openings (State of Florida): Within the State of Florida, provide copy of current State of Florida Product Approval or Metro-Dade County Notice of Acceptance (NOA) as proof of compliance that doors, frames and hardware for exterior opening assemblies have been tested and approved for use at the wind load and design pressure level requirements specified for the Project.
    - a. Hurricane Resistant Components (State of Florida): Within the State of Florida, provide copy of independent, third party certified listing conforming to ANSI A250.13.

## 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.
  - 1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
  - 2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
  - 3. Smoke Control Door Assemblies: Comply with NFPA 105.
    - a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
- E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
  - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

## 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

## 1.7 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

## 1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:
  - 1. CECO Door Products (C). Florida product Approval **#FL16355.2**
  - 2. Curries Company (CU).

### 2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

### 2.3 HOLLOW METAL DOORS

- A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

8C-4 Hollow Metal Doors

B. Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
2. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
4. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
  - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
2. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
4. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

D. Manufacturers Basis of Design:

1. Curries Company (CU) - Energy Efficient - 777 Trio-E Series.

## 2.4 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Manufacturers Basis of Design:

- a. CECO Door Products (C) – SU SR Series. Florida Product Approval #FL4553.1
  - b. Curries Company (CU) – M Series.
- C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
- 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
  - 2. Manufacturers Basis of Design:
    - a. CECO Door Products (C) - SU Series.
    - b. Curries Company (CU) - M Series.
- D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

## 2.5 FRAME ANCHORS

- A. Jamb Anchors:
- 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
  - 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
  - 3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.
  - 4. Windstorm Opening Anchors: Types as tested and required for indicated wall types to meet specified wind load design criteria.
- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

## 2.6 LOUVERS

- A. Metal Louvers: Unless otherwise indicated provide louvers to meet the following requirements.
- 1. Blade Type: Vision proof inverted V or inverted Y.
  - 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.
- B. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.
- 1. Manufacturers: Subject to compliance with requirements, provide louvers to meet rating indicated.

2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

## 2.7 LIGHT OPENINGS AND GLAZING

- A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
- B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.
- D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

## 2.8 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

## 2.9 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:
  1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
  2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
  3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
  4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
  - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
9. Jamb Anchors: Provide number and spacing of anchors as follows:
  - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
    - 1) Two anchors per jamb up to 60 inches high.
    - 2) Three anchors per jamb from 60 to 90 inches high.
    - 3) Four anchors per jamb from 90 to 120 inches high.
    - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
  - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
    - 1) Three anchors per jamb up to 60 inches high.
    - 2) Four anchors per jamb from 60 to 90 inches high.
    - 3) Five anchors per jamb from 90 to 96 inches high.
    - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
    - 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
  - c. Severe Storm Shelter Openings: Provide jamb, head, and sill anchors in accordance with manufacturer's tested and approved assemblies.

10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
  11. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.
- E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
  2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
  3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
  4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

## 2.10 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

- B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

### 3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
  - 1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
  - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
  - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
  - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
  - 1. Non-Fire-Rated Standard Steel Doors:
    - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
    - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
    - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
    - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
  - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

### 3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.

- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 08

## **SECTION 8D DOOR HARDWARE**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes commercial door hardware for the following:

- 1. Swinging doors.
- 2. Sliding doors.
- 3. Other doors to the extent indicated.

- B. Door hardware includes, but is not necessarily limited to, the following:

- 1. Mechanical door hardware.
- 2. Cylinders specified for doors in other sections.

- C. Related Sections:

- 1. Division 08 Section "Operations and Maintenance".
- 2. Division 08 Section "Door Schedule".
- 3. Division 08 Section "Hollow Metal Doors and Frames".
- 4. Division 08 Section "Flush Wood Doors".
- 5. Division 08 Section "Aluminum-Framed Entrances and Storefronts".

- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

- 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
- 2. ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies.
- 3. ASTM E1886 - Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
- 4. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure difference.
- 5. ICC/IBC - International Building Code.
- 6. NFPA 70 - National Electrical Code.
- 7. NFPA 80 - Fire Doors and Windows.
- 8. NFPA 101 - Life Safety Code.
- 9. NFPA 105 - Installation of Smoke Door Assemblies.
- 10. TAS-202-94 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure.
- 11. TAS-203-94 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
- 12. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

### 1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:
  - a. Type, style, function, size, label, hand, and finish of each door hardware item.
  - b. Manufacturer of each item.
  - c. Fastenings and other pertinent information.
  - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
  - e. Explanation of abbreviations, symbols, and codes contained in schedule.
  - f. Mounting locations for door hardware.
  - g. Door and frame sizes and materials.
  - h. Warranty information for each product.
4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

D. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

#### 1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

F. Hurricane Resistant Exterior Openings (State of Florida including the High Velocity Hurricane Zone (HVHZ)): Provide exterior door hardware as complete and tested assemblies, or component assemblies, including approved doors and frames specified under Section 081113 "Hollow Metal Doors and Frames", to meet the design pressures, debris impact resistance, and glass and glazing requirements as detailed in the current State of Florida building code sections applicable to the Project.

1. Each unit to bear third party permanent label in accordance with the Florida Building Code requirements.

G. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

H. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.

3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

I. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

J. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

#### 1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

## 1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. 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. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
  - 1. Structural failures including excessive deflection, cracking, or breakage.
  - 2. Faulty operation of the hardware.
  - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 4. Electrical component defects and failures within the systems operation.
- C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
  - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Please note that ASSA ABLOY is transitioning the Yale Commercial brand to ASSA ABLOY ACCENTRA. This affects only the brand name; the products and product numbers will remain unchanged. The brand transition is expected to be complete in or about May of 2024, and products shipping after that time will be branded ASSA ABLOY ACCENTRA.
- D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

### 2.2 BUTT HINGES

- A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
  - 1. Quantity: Provide the following hinge quantity:

- a. Two Hinges: For doors with heights up to 60 inches.
  - b. Three Hinges: For doors with heights 61 to 90 inches.
  - c. Four Hinges: For doors with heights 91 to 120 inches.
  - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
    - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
    - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
  3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
    - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
    - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
  4. Hinge Options: Comply with the following:
    - a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
  5. Manufacturers:
    - a. Hager Companies (HA) - BB Series, 5-knuckle.
    - b. McKinney (MK) - TA/T4A Series, 5-knuckle.
    - c. dormakaba Best (ST) - F/FBB Series, 5-knuckle.

## 2.3 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.
  1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
  2. Furnish dust proof strikes for bottom bolts.
  3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
  4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
  5. Manufacturers:
    - a. Burns Manufacturing (BU).
    - b. Rockwood (RO).
    - c. Trimco (TC).
- B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Pulls, where applicable, shall be provided with a 10" clearance from the finished floor on the push side to accommodate wheelchair accessibility.
5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
6. Manufacturers:
  - a. Hiawatha, Inc. (HI).
  - b. Rockwood (RO).
  - c. Trimco (TC).

## 2.4 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
  1. Manufacturers:
    - a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA).
    - b. Corbin Russwin Hardware (RU).
    - c. Sargent Manufacturing (SA).
- B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:
  1. Threaded mortise cylinders with rings and cams to suit hardware application.
  2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
  3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
  4. Tubular deadlocks and other auxiliary locks.
  5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
  6. Keyway: Manufacturer's Standard.
- C. Keying System: Each type of lock and cylinders to be factory keyed.
  1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
  2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
  3. New System: Key locks to a new key system as directed by the Owner.
- D. Key Quantity: Provide the following minimum number of keys:
  1. Change Keys per Cylinder: Two (2)
  2. Master Keys (per Master Key Level/Group): Five (5).
  3. Construction Keys (where required): Ten (10).
- E. Construction Keying: Provide construction master keyed cylinders.

F. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.5 KEY CONTROL

A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:
  - a. Lund Equipment (LU).
  - b. MMF Industries (MM).
  - c. Telkee (TK).

2.6 CYLINDRICAL LOCKS AND LATCHING DEVICES

A. Tubular Locksets, Grade 1 (Extra Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed tubular locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide locksets with functions and features as follows:
  - a. Modular design with easy to change functions in the field.
  - b. Meets ANSI/BHMA A156.41 for single motion egress.
  - c. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.
  - d. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
  - e. Meets Florida Building Code FL2998 and UL Certification Directory ZHEM.R21744 for latching hardware for hurricane requirements.
  - f. Meets UL Certification Directory ZHLL.R21744 for products used in windstorm rated assemblies.
  - g. Ten-year limited warranty for mechanical functions.

B. Cylindrical Locksets, Grade 1 (Commercial Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed cylindrical locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Manufacturers:
  - a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) 4700LN Series.
  - b. Corbin Russwin Hardware (RU) - CL3500 Series.

## 2.7 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
  2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
  3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
  4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
1. Strikes for Mortise Locks and Latches: BHMA A156.13.
  2. Strikes for Bored Locks and Latches: BHMA A156.2.
  3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
  4. Dustproof Strikes: BHMA A156.16.

## 2.8 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. Exit devices shall have a five-year warranty.
  2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
  3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
  4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
  5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
  6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
    - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
  7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
  8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.

9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
12. Hurricane and Storm Shelter Compliance: Devices to be U.L. listed for windstorm assemblies where applicable. Provide the appropriate hurricane or storm shelter products that have been independently third party tested, certified, and labeled to meet state and local windstorm building codes applicable to project.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide exit devices with functions and features as follows:
  - a. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.
  - b. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
  - c. Meets Florida Building Code FL2998 and UL Certification Directory ZHEM.R21744 for latching hardware for hurricane requirements.
  - d. Meets UL Certification Directory ZHLL.R21744 for products used in windstorm rated assemblies.
  - e. Narrow or wide style exterior trim as specified in the hardware sets.
  - f. Ten-year limited warranty for mechanical features.

C. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.

1. Manufacturers:
  - a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - 7000 Series.
  - b. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
  - c. Sargent Manufacturing (SA) - 80 Series.

## 2.9 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.
1. Manufacturers:
    - a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - 3500 Series.
    - b. Corbin Russwin Hardware (RU) - DC6000 Series.
    - c. Norton Rixson (NO) - 8500 Series.
    - d. Sargent Manufacturing (SA) - 1431 Series.
- C. Door Closers, Surface Mounted (Standard Duty): ANSI/BHMA 156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.
1. Manufacturers:
    - a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - 2700 Series.
    - b. Corbin Russwin Hardware (RU) - DC3000 Series.
    - c. Sargent Manufacturing (SA) - 1331 Series.
    - d. Norton Rixson (NO) - 210 Series

## 2.10 ARCHITECTURAL TRIM

- A. Door Protective Trim
1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
  2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
  3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
  4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:
    - a. Stainless Steel: 300 grade, 050-inch thick.
  5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:
  - a. Rockwood (RO).

## 2.11 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
  1. Manufacturers:
    - a. Hager Companies (HA).
    - b. Rockwood (RO).
    - c. Trimco (TC).

## 2.12 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
  1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
  1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
  1. National Guard Products (NG).
  2. Pemko (PE).
  3. Zero (ZE).

## 2.13 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

## 2.14 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

### 3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

### 3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
  - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
  - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.

3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

### 3.4 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
  1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

### 3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

### 3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

### 3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handling and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

B. Manufacturer's Abbreviations:

1. MK - McKinney
2. RO - Rockwood
3. YA - ASSA ABLOY ACCENTRA, formerly known as Yale
4. SA - SARGENT
5. RF - Rixson
6. PE - Pemko
7. OT - Other

**Hardware Sets**

**Set: 1.0**

**Doors: 101**

**Description: EXT PR - ALUM - EAC [BALLISTIC] ADA**

1	Continuous Hinge	CFMXXHD1 PT		PE	
1	Concealed Vert Rod Exit, Exit Only	7220 B MELR EO	630	YA	⚡
1	Door Pull	BF168	US32D	RO	
1	Automatic Opener	6000 Series - Mtg as required	689	NO	⚡
1	Door Stop	480	US26D	RO	
1	Threshold	2005AT MSES25SS		PE	
1	Gasketing	by door / frame mfg			
1	ElectroLynx Harness	QC-C1500 [ PS to hinge ]		MK	⚡
1	ElectroLynx Harness	QC-CXXP [ Lock / exit to hinge ]		MK	⚡
1	Card Reader	By security vendor- Div 28		OT	
1	Wall actuator (Touchless)	700 / 506 as selected		NO	⚡
1	Door Position Switch	DPS-M/W-WH (as required)		SU	⚡

1	Power Supply	AQL4-R8E1		SU	⚡
1	Electric Power Transfer	EL-CEPT	630	SU	⚡

Notes: Hardware listed for design criteria, confirm with specific door manufacturer the hardware requirements to meet specified ballistic rating - confirm hardware requirements with door mfg. Provide 3rd party test results for confirmation.

Presenting a valid credential releases the exit device and activates the operator. the REX , both leaves (request to exit switch) located in the panic device allows for free egress

Wall actuator retracts the latchbolt and activates the auto operator

Entry by key override at all times

Door can be operated manually without auto operator

Door is fail secure

Note that REX is used for intrusion alarm and door held open notification only and is not used to allow egress (no electrical device used to allow egress). Specify Mechanical Free Egress.

## Set 2.0

### Door 101A

#### Description: EXT CORR - EAC

3	Hinge, Full Mortise	TA2314 x NRP 4-1/2" x 4-1/2"	US32D	MK
1	Rim Exit Device, Nightlatch	7150 WS B MELR AU627F	630	YA
1	Mortise Cylinder	As required	626	YA
1	Surface Closer	CPS8501	689	NO
1	Kick Plate	K1050 10" X 2" LDW	US32D	RO
1	Threshold	2005AT MSES25SS		PE
1	Gasketing	S88BL X LAR		PE
1	Rain Guard	346C x LAR		PE
1	Sweep	315CN		PE
1	ElectroLynx Harness	QC-C1500 [PS to hinge]		MK
1	ElectroLynx Harness	QC-CXXP [Lock / exit to hinge]		MK
1	Card Reader	By security vendor- Div 28		OT
1	Door Position Switch	DPS-M/W-WH (as required)		SU
1	Power Supply	AQL4-R8E1		SU
1	Electric Power Transfer	EL-CEPT	630	SU

Notes: Door normally closed and secured.

Authorized credential retracts the latchbolt to allow free entry, door relocks upon closing. REX (request to exit) switch in device rail allow for free exit at all times

Entry by key override at all times

Door is fail secure

Hardware listed for design criteria, confirm with specific door manufacturer the hardware requirements to meet specified windstorm rating - Provide 3rd party test results for confirmation.

Note that REX is used for intrusion alarm and door held open notification only and is not used to allow egress (no electrical device used to allow egress). Specify Mechanical Free Egress.

### Set 3.0

#### Doors 102, 103, 111, 112

Description: OFFICE

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Entry Lock	AU 5407LN	626	YA
1	Door Stop	409 / 446 as required	US26D	RO
3	Silencer	608		RO

### Set 4.0

#### Doors 104B

Description: EXT CORR – EAC

3	Hinge, Full Mortise	TA2314 x NRP 4-1/2" x 4-1/2"	US32D	MK
1	Rim Exit Device, Nightlatch	7150 WS B MELR AU627F	630	YA
1	Mortise Cylinder	As required	626	YA
1	Surface Closer	CPS8501	689	NO
1	Kick Plate	K1050 10" X 2" LDW	US32D	RO
1	Threshold	2005AT MSES25SS		PE
1	Gasketing	S88BL X LAR		PE
1	Rain Guard	346C x LAR		PE
1	Sweep	315CN		PE
1	ElectroLynx Harness	QC-C1500 [ PS to hinge ]		MK
1	ElectroLynx Harness	QC-CXXP [ Lock / exit to hinge ]		MK
1	Card Reader	By security vendor- Div 28		OT
1	Door Position Switch	DPS-M/W-WH (as required)		SU
1	Power Supply	AQL4-R8E1		SU
1	Electric Power Transfer	EL-CEPT	630	SU

Notes: Door normally closed and secured.

Authorized credential retracts the latchbolt to allow free entry, door relocks upon closing. REX (request to exit) switch in device rail allow for free exit at all times

Entry by key override at all times

Door is fail secure

Hardware listed for design criteria, confirm with specific door manufacturer the hardware requirements to meet specified windstorm rating - Provide 3rd party test results for confirmation.

Note that REX is used for intrusion alarm and door held open notification only and is not used to allow egress (no electrical device used to allow egress). Specify Mechanical Free Egress.

### Set 5.0

#### Doors 104, 107, 110, 113, 114, 115A, 115B

Description: Interview, Breakroom, Storage, Conference

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Passage Latch	AU 5401LN	626	YA
1	Door Stop	409 / 446 as required	US26D	RO
3	Silencer	608		RO

### Set 6.0

#### Doors 104A, 108

Description: SGL - RESTROOM [STOP ARM]

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Privacy Lock	AU 4702LN	626	YA
1	Surface Closer	2721	689	YA
1	Gasketing	S88BL		PE

### Set 7.0

#### Doors 105, 106, 109

Description: SGL – MECH, ELEC, DATA

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Storeroom or Closet Lock	AU 4705LN	626	YA
1	Wall / Floor Stop	409 or 446 as required	US32D	RO
3	Silencer	608-RKW		RO

## SECTION 8E

### ALUMINUM LOUVERS AND BRICK VENTS

#### 8E-01. ALUMINUM LOUVERS AND BRICK VENTS:

- A. Manually operated louvers: Shall be in sizes and shapes as shown on the drawings equal to Construction Specialties, Inc., Aluminum Model 4830 M for manual operation. Louver blades to be storm proof type center pivoted with two reinforcing bosses. Furnish with aluminum insect screen on exterior side and an aluminum expanded metal screen on the interior side. Expanded metal shall be equal to ½", 081 standard expanded aluminum and set in a screened or heavy duty extruded aluminum frame.

Finish to be C/S Kynar 500 coating in color as selected by Architect.

- B. Louvers (Fixed): Furnish and install at locations shown and in sizes and shapes shown, aluminum fixed louvers equal to Construction Specialties Model 4110 storm proof for louver widths or diameters up to 24" and Model 4130 storm proof for louver widths or diameters over 24".

All louvers to be furnished complete with C/S insect screen and an aluminum expanded metal screen on the interior side set in a screwed on heavy duty extruded frame. The expanded metal shall be equal to .081 standard expanded aluminum.

Frames and blades to be 6063-T52 alloy minimum .081" for 4110 louvers and .125" for 4130 louvers, with reinforcing bosses. Heads, jambs, and sills to be one piece structural members and to have integral caulking slot and retaining bead. All fastenings to be stainless steel.

Structural supports to be designed by C/S to carry a wind load of not less than 20 pounds p.s.f.

Finish to be C/S Kynar 500 coating in color as selected by Architect.

- C. Brick Vents: Shall be in sizes as shown on the mechanical drawings and equal to Construction Specialties, Inc., Aluminum Brick Vent.

Model 22EX for 16 x 4-7/8 vents

Model 23EX for 16 x 7-3/4 vents

Vents shall include 7 x 7 mesh aluminum screen, continuous drip top and bottom, weep holes and minimum wall thickness of .125".

Coordinate with mechanical contractor for exact location and installation for proper connection to FIA duct.

Finish shall be Kynar 500 finish in color selected by Architect.

D. Motorized Louvers:

Shall be in sizes as indicated on the drawings and equal to Construction Specialties, Inc., aluminum electric operating louver model 6870E.

Frame and blades to be 6063-T52 alloy .081" thick. All louver blades to be storm proof type, center pivoted with two reinforcing bosses and have ½" diameter zamac alloy pinion operating in self-lubricating nylon bearings. All blades shall be operated by concealed drive arms at each jamb. Drive arms shall be connected by a 5/8" diameter torsion bar operating in nylon bearings. All louver blades and sills shall be equipped with jamb gaskets riveted to blade ends. When closed, air leakage through the louvers shall not exceed 1.72 CFM per square foot of face area at a wind velocity of 30 m.p.h.

Structural supports to be designed to carry a wind load of not less than 20 lbs. per square foot.

Furnish with heavy duty aluminum bird screen, ½" mesh, .063 wire intercrimped and secured with a 12 B and S gauge extruded aluminum frame.

Furnish with EX110 motor unit for single phase and provide push button control with pilot lamps indicating open & closed position for each louver and to be interlocked with exhaust fans so when fan is switched on louvers operate to open position.

**Furnish shop drawings for approval.**

- E. **Shop drawings for louvers used in exterior walls shall also include the product approval number and any test data that is required to comply with 2023 Florida Building Code, Section 17. See "Supplementary and Special Conditions", Paragraph 15-6.**

**END OF SECTION**

## SECTION 9A

### CERAMIC TILE

#### 9A-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

#### 9A-02. SCOPE:

Furnish all labor, materials, equipment and services necessary and/or required to install all ceramic and quarry floor tile and base where scheduled on the drawings and as indicated. All tile patterns and colors shall be as approved and selected by the Architect. Tile work shall be performed in accordance with Standards of the Tile Council of American

#### 9A-03. SAMPLES AND CERTIFICATES OF GRADE:

The Contractor shall submit to the Architect for approval three (3) samples of each type of tile he proposes to use. Package shall be branded with a shipping mark stating grade and shall be subject to the inspection of the Architect.

#### 9A-04. CERAMIC FLOOR TILE:

##### A. Materials:

1. In Areas where noted and where shown on the Room Finish Schedule:
  - a. Floor Tile: Shall be American Olean Unglazed porcelain mosaics 2' x2'x 1/4". Floor tile shall be Price Range One. Floor tile shall be non-slip
  - b. Base: Shall be 6" high coved base
  - c. Grout: Grout to be equal to Bonsal Epoxy Grout for tile and a sanded grout for wall tile.
  - d. Tile and grout colors will be as selected by Architect.

NOTE: In some areas two colors of tile may be used, Architect will provide the pattern to the successful bidder.

##### B. Installation:

1. Floor Tile: Shall be laid with a thin set grout over new floors and a 1/4" grout joint and installed in accordance with ATC F112-93.  
Floor tile laid in rooms with floor drains to be installed so positive slope to floor drains are provided.
3. It will be the responsibility of the ceramic tile subcontractor to ensure that the new concrete floors are satisfactory to properly receive new floor tile. If new concrete

floors are not appropriate for new tile installation the Project Manager shall be notified immediately and Project Architect.

9A-05      CERAMIC WALL TILE:

A.      Materials:

1.      Wall Tile: Shall be American Olean Bright Tile. Colors as selected by the Architect. Units shall be 4 1/4" x 4 1/4". Furnish with bullnose, cove base and angles as required. Base shall be same size units as wall units.
2.      Grout: Shall be "Crest" tile grout mixed to proper consistency. Color shall match tile on walls, grey for floors.

B.      Installation:

1.      All tiles shall be well-bedded, and all joints grouted flush with pointing mortar of white Portland Cement and fine sand. Furnish grout with approved mildew agent.
2.      Wall Tile: Tile shall be set on 3/4" cement mortar and metal lath over waterproof membrane applied to existing or new masonry wall construction in accordance with ATC Specifications W 241-76 and in Masonry ATC Specifications W 2521-76. Membrane shall extend out onto sub floor below tile floor and sealed and set with adhesive. Grout and clean.

Where walls are of steel stud and sheetrock, wall tile shall be set on 1/2" Durock Board as manufactured by U S Gypsum, new wall construction in accordance with ATC. All joints shall be properly taped, and the contractor shall inspect application of wall board for proper secureness in wall studs and that all joints of wall board joints occur at wall anchored studs as detailed. All joints are to be taped full length of cement board.

3.      Accent Tile: See interior elevations for designer accent wall pattern.
4.      See Demolition Plan for the removal of all existing wainscot wall tile and base. The ceramic subcontractor shall preform all operations necessary to prepare the existing walls after removal of existing tile, to receive new setting bed and wall tile.

9A-06.      QUARRY TILE:      N.A.

9A-07.      MARBLE THRESHOLDS:

The tile contractor shall furnish and install a marble threshold at every door opening or location where ceramic tile or quarry tile abut a different type of flooring and/or at any location noted on the drawings.

The marble threshold shall be 1 \_ " thick and width as required. The threshold shall be beveled and installed so the bottom of the bevel projects no more than 1/4" above the surface of either

adjoining flooring material.

9A-08.        SUBMITTAL:

Contractor to submit samples of each material specified in this section along with manufacturers catalog and specifications for each of the materials.

9A-09.        CLEANING:

On completion of tile work the floor and wall tile shall be thoroughly cleaned and polished. Before any traffic is permitted on the floor the walls and floor shall be sealed in an approved two-coat application, and when sealer is dry, the entire floor area covered with 20# building paper which shall be maintained in good condition until removal just prior to the Final Inspection. Sealer shall be equal to "Clear Bond" by Guardian Chemical Company.

9A-10.        GUARANTEE:

This Contractor shall furnish guarantee of all ceramic and quarry tile materials and workmanship for a period of one (1) year from date of final acceptance of building.

9A-11.        RESINOUS HIGH BUILD EPOXY FLOOR: N.A.

**END OF SECTION.**

## **SECTION 9B**

### **RESILIENT TILE (LVP, LVT), CARPET TILE, AND RUBBER BASE**

#### 9B-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F, of these specifications shall apply to and form a part of this Section as if written in full herein.

#### 9B-02. SCOPE:

Provide all labor, materials, and equipment necessary to install new floor covering and base where shown and scheduled on the drawings and as specified.

#### 9B-03. RESILIENT TILE FLOORING

##### 1) GENERAL

###### (1) RELATED DOCUMENTS

- (a) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

###### (2) SUMMARY

- (a) Section Includes:

- (i) Solid vinyl floor tile.

###### (3) ACTION SUBMITTALS

- (a) Product Data: For each type of product.

- (b) Sustainable Design Submittals:

- (i) **Product Data**: For adhesives, indicating VOC content.
  - (ii) **Laboratory Test Reports**: For adhesives, indicating compliance with requirements for low-emitting materials.
  - (iii) **Laboratory Test Reports**: For flooring products, indicating compliance with requirements for low-emitting materials.

- (c) Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

- (i) Show details of special patterns.

- (d) Samples: Full-size units of each color and pattern of floor tile required.
- (e) Product Schedule: For floor tile. [Use same designations indicated on Drawings.]

#### (4) INFORMATIONAL SUBMITTALS

- (a) Qualification Data: For Installer.

#### (5) CLOSEOUT SUBMITTALS

- (a) Maintenance Data: For each type of floor tile to include in maintenance manuals.

#### (6) MAINTENANCE MATERIAL SUBMITTALS

- (a) Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - (i) Floor Tile: Furnish one box for every 100 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

#### (7) QUALITY ASSURANCE

- (a) Installer Qualifications: A qualified installer with a minimum of 5 years commercial resilient flooring installation experience, and who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
  - (i) Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.
- (b) Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - (i) Build mockups for floor tile including resilient base and accessories.
    1. Size: Minimum 100 sq. ft. (9.3 sq. m) for each type, color, and pattern and locations as shown on drawings.
  - (ii) Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - (iii) Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

(8) DELIVERY, STORAGE, AND HANDLING

- (a) Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

(9) FIELD CONDITIONS

- (a) HVAC system should be operational and running for a minimum of 7 days prior to resilient tile installation and remain running after resilient tile installation.
- (b) Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C), in spaces to receive floor tile during the following time periods:
  - (i) 48 hours before installation.
  - (ii) During installation.
  - (iii) Permanently after installation.
- (c) Close spaces to traffic during floor tile installation.
- (d) Close spaces to traffic, all heavy rolling loads, and point loads for 48 to 72 hours after floor tile installation.
- (e) Install floor tile after other finishing operations, including painting, have been completed.

(10) WARRANTY

- (a) Special Warranty for Resilient Tile; Manufacturer agrees to repair or replace defective material within specified warranty period.
  - (i) Warranty does not include installer's workmanship.
  - (ii) Resilient tile must be installed and maintained according to manufacturer's recommendations.
  - (iii) Warranty Period:
    1. Manufacturing Defects Warranty: 10 years.
    2. Limited Commercial Wear Warranty: 10 years.
    3. Under bed Warranty: 10 years. (Requires Shaw 4100 or S150 adhesive.)

## 2) PRODUCTS

### (1) PERFORMANCE REQUIREMENTS

- (a) Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
  - (i) Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- (b) Flooring products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

### (2) SOLID VINYL FLOOR TILE

- (a) Basis-of-Design Product: Subject to compliance with requirements, provide Patcraft Typeface I312V.
- (b) Tile Standard: ASTM F 1700.
  - (i) Class: Class III, printed film vinyl tile.
  - (ii) Type: A Smooth.
- (c) Overall Thickness: 0.098 inch (2.5 mm).
- (d) Wear Layer: 20 mil (0.5 mm) ExoGuard™ Quatrz Enhanced Urethane.
- (e) Wear Layer Thickness: 0.020 inch (0.5 mm).
- (f) Size: 23-5/8 by 23-5/8 inches (600mm by 600 mm).
- (g) Colors and Patterns: As selected by Architect from full range of manufacturer's designations.
- (h) Test Data:
  - (i) Slip Resistance: ASTM D 2047, ADA Compliant.
  - (ii) Static Load, ASTM F 970: 2000 psi (lbs.sq.in) – 0.005 in.
  - (iii) Residual Indentation, ASTM 1914: Passes <8%
  - (iv) Flexibility, ASTM F 137: Passes.
  - (v) Dimensional Stability: Federal Standard #501A, Method 6211 >0.02"/ft.
  - (vi) Resistance to Heat, ASTM F 1514: Passes.
  - (vii) Resistance to Light, ASTM F 1515: Passes.
  - (viii) Resistance to Chemicals, ASTM 925: Passes.
  - (ix) Resistance to Fungi, ASTM G 21: Passes, Rate zero (Rate zero: Fungi Free).
  - (x) Antibacterial Activity, AATCC 147: Passes, resists the propagation of bacteria.
  - (xi) Radiant Flux, ASTM E 648: greater than 0.45 watts/cm, NFPA Class I.

(xii)Smoke Density, ASTM E 662: less than 450, Passes.

### (3) INSTALLATION MATERIALS

- (a) Trowel-able Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- (b) Adhesives: Water-resistant adhesive such as the Shaw 4100 or Shaw S150 to suit floor tile and substrate conditions indicated.
  - (i) Adhesives shall have a VOC content of 50 g/L or less.
  - (ii) Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- (c) Floor Polish: Floor Finish is optional. If floor finish is desired, provide protective, neutral pH liquid floor-polish products recommended by floor tile manufacturer.

## 3) EXECUTION

### (1) EXAMINATION

- (a) Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
  - (i) Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- (b) Proceed with installation only after unsatisfactory conditions have been corrected.

### (2) PREPARATION

- (a) Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- (b) Concrete Substrates: Prepare according to ASTM F 710.
  - (i) Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - (ii) Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using

mechanical methods recommended by floor tile manufacturer. Do not use solvents.

- (iii) Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
- (iv) Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
  - 1. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates are below 90 percent relative humidity level.

- (c) Fill cracks, holes, and depressions in substrates with trowel-able leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- (d) Do not install floor tiles until they are the same temperature as the space where they are to be installed.
  - (i) At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- (e) Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

### (3) FLOOR TILE INSTALLATION

- (a) Comply with manufacturer's written instructions for installing floor tile.
- (b) Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
  - (i) Lay tiles square with room axis.
- (c) Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
  - (i) Lay tiles in pattern of colors and sizes indicated.
- (d) Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- (e) Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

- (f) Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- (g) Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- (h) Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

#### (4) CLEANING AND PROTECTION

- (a) Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- (b) Perform the following operations immediately after completing floor tile installation:
  - (i) Remove adhesive and other blemishes from exposed surfaces.
  - (ii) Sweep and vacuum surfaces thoroughly.
  - (iii) Damp-mop surfaces to remove marks and soil.
- (c) Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- (d) Optional Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
- (e) Cover floor tile until Substantial Completion.

### 9B-04. CARPET TILE

#### (1) RELATED DOCUMENTS

- (a) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### (2) SUMMARY

- (a) Section includes modular, **[tufted]** **[needle-punched]** carpet tile.

(b) Related Requirements:

- (i) Section 024119 "Selective Demolition" for removing existing floor coverings.
- (ii) Section 096513 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.
- (iii) Section 096816 "Sheet Carpeting" for carpet roll goods.

(3) PREINSTALLATION MEETINGS

(a) Preinstallation Conference: Conduct conference at project site.

- (i) Review methods and procedures related to carpet tile installation including, but not limited to, the following:
  1. Review delivery, storage, and handling procedures.
  2. Review ambient conditions and ventilation procedures.
  3. Review subfloor preparation procedures.
  4. Follow manufacturer's modular carpet installation guidelines and/or Carpet & Rug Institute Installation Standard 104 where applicable.

(4) ACTION SUBMITTALS

(a) Product Data: For each type of product.

- (i) Include manufacturer's written specifications and lab documents for any physical testing.
- (ii) Include manufacturer's written installation recommendations for each type of substrate as specified in carpet manufacturer's installation guidelines and/or Carpet & Rug Institute Installation Standard 104, where applicable.
- (iii) Include carpet maintenance recommendations as outlined by the carpet manufacturer.
- (iv) Carpet Manufacturer shall also submit a plan for recycling the specified carpet at the end of the useful life of the carpet.

(b) Sustainable Design Submittals:

- (i) Product Data: For adhesives, indicating VOC content.
- (ii) Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
- (iii) Laboratory Test Reports: For flooring products, indicating compliance with requirements for testing and product requirements of CRI's "Green Label Plus" testing program.
- (iv) Laboratory Test Reports: For flooring products, indicating compliance with requirements for low-emitting materials.

(c) Shop Drawings: For carpet tile installation, plans showing the following:

- (i) Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
- (ii) Carpet tile type, color, and dye lot.
- (iii) Type of subfloor.

- (iv) Type of installation.
  - (v) Pattern of installation.
  - (vi) Pattern type, location, and direction.
  - (vii) Installation method (monolithic, quarter turn, ashlar, brick random, interactive patterning).
  - (viii) Type, color, and location of insets and borders.
  - (ix) Type, color, and location of edge, transition, and other accessory strips.
  - (x) Transition details to other flooring materials.
- (d) Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
- (i) Carpet Tile: Full-size Sample.
  - (ii) Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.
- (e) Samples for Initial Selection: For each type of carpet tile.
- (i) Include Samples of exposed edge, transition, and other accessory stripping involving color or finish selection.
- (f) Samples for Verification: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
- (i) Carpet Tile: Full-size Sample.
  - (ii) Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.
- (g) Product Schedule: For carpet tile. Use same designations indicated on Drawings.
- (h) Sustainable Product Certification: Provide ANSI/NSF 140 certification for carpet products.

## (5) INFORMATIONAL SUBMITTALS

- (a) Qualification Data: For Installer.
- (b) Product Test Reports: For carpet tile, for tests performed by a qualified independent testing agency.

## (6) CLOSEOUT SUBMITTALS

- (a) Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
  - (i) Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.

- (ii) Precautions for cleaning materials and methods that could be detrimental to carpet tile.

#### (7) MAINTENANCE MATERIAL SUBMITTALS

- (a) Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - (i) Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than **10.67 sq. yd. (8.9 sq. m)**.

#### (8) QUALITY ASSURANCE

- (a) Manufacturer Qualifications: Carpet manufacturer shall have no less than 5-years' experience of producing recyclable carpet tile and shall have published product literature clearly indicating compliance with requirements of this section.
  - (i) Certification: ISO 9001 and ISO 14001 certified manufacturer.
  - (ii) Commitment to Sustainability: Carpet manufacturer must practice environmental responsibility through programs of recycling, reuse, conservation, and source reduction. Manufacturer should have a public demonstration of such efforts through reporting documents such as an annual sustainability report that contains third party verification and confirmation.
  - (iii) Carpet manufacturer must take back modular carpet tile to be recycled free of charge for quantities of **500 sq. yards (418 sq. m)** or more within continental U.S. Program variations exists for other some geographical locations.
- (b) Installer Qualifications: An installer with a minimum of 5 years commercial carpet installation experience, and who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.
- (c) Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - (i) Build mockups at locations and in sizes shown on Drawings.
  - (ii) Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### (9) DELIVERY, STORAGE, AND HANDLING

- (a) Comply with carpet manufacturer's installation recommendations and the Carpet & Rug Institute Installation Standard 104 where applicable.

(10) FIELD CONDITIONS

- (a) Comply with carpet manufacturer's installation recommendations and the Carpet & Rug Institute Installation Standard 104 for temperature, humidity, and ventilation limitations.
- (b) Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.
- (c) HVAC system should be operational and running prior to carpet installation and remain running after carpet installation.
- (d) Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to allow bond between adhesive and concrete. Concrete slabs should have moisture and pH readings that are within the specified tolerance of the adhesive to be used.
- (e) Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

(11) WARRANTY

- (a) Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
  - (i) Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
  - (ii) Failures include, but are not limited to, the following:
    1. More than 10 percent face fiber loss, and edge raveling.
    2. Dimensional instability.
    3. Excess static discharge.
    4. Loss of tuft-bind strength.
    5. Delamination.
    6. Where face fiber is 100 percent solution dyed, in ability to remove acid-based stains.
    7. Lack of colorfastness to atmospheric contaminants.
  - (iii) Warranty Period: Lifetime Commercial Limited Warranty.

2) PRODUCTS

(1) CARPET TILE

- (a) Basis-of-Design Product: Subject to compliance with requirements; **Patcraft, I0239 Speak In Color** or comparable product by one of the following:

- (i) [Interface, LLC.](#)
  - (ii) J&J Invision; J&J Industries, Inc.
  - (iii) [Mannington Mills, Inc.](#)
  - (iv) [Tandus; a Tarkett company.](#)
- (b) Source Limitations:
- (i) Single Source Responsibility: Provide products that have components manufactured by a single source. Fiber and backing, as well as final carpet product, should be manufactured and warranted by same company.
  - (ii) Commitment to sustainability: Carpet manufacturer must practice environmental responsibility through programs of source reduction, recycling, reuse, and conservation.
- (c) Color: **As selected by Architect from manufacturer's full range**
- (d) Pile Characteristics: **Multi Level Pattern Loop** pile.
- (e) Fiber Content: **Nylon - 100 percent trilobal, minimum 24 denier per filament DPF nylon 6. Fiber must contain a minimum of 25 percent recycled content.**
- (f) Fiber Name: **Eco Solution Q Nylon**
- (g) Dye Method: **100 percent Solution Dye.**
- (h) Gauge: **1/12 ends per inch (mm)>.**
- (i) Stitches: **10 stitches per inch (mm)>.**
- (j) Surface Pile Weight: **18 oz./sq. yd. (g/sq. m)>.**
- (k) Density: **7200 oz./cu. yd. (g/cu. cm)>.**
- (l) Primary Backing: Nonwoven synthetic.
- (m) Secondary Backing: High performance precoat laminated to a proprietary thermoplastic polyolefin compound with a fiberglass reinforced layer. Backing must contain a minimum of 40 percent recycled content and be SCS NSF 140 Gold certified. Backing should be recyclable, PVC free, free of 4-PCH, brominated flame retardants, and phthalate plastizers.
- (i) Total Backing Weight: Not to exceed **80 oz./sq yd (339.1 g/sq m).**
- (n) Backing System: Non-PVC.
- (o) Applied Treatments:
- (i) Soil-Resistance Treatment: **[Other] [None].**
- (p) Total Weight: **91 oz./sq. yd.** for finished carpet tile.

- (q) Size: [24 by 24 inches (610 by 610 mm)] [18 by 36 inches (457 by 914 mm)].
- (r) Texture Appearance Retention Rating (T.A.R.R.):
- (i) Appearance Retention Rating (T.A.R.R.): **Severe**.
- (s) Recycling Requirements:
- (i) Total Carpet Product Recycled Content:
    1. Pre-Consumer Recycled Content: **36.200000000000003** percent.
    2. Post-Consumer Recycled Content: **0** percent.
    3. Total Recycled Content: **36.200000000000003** percent.
  - (ii) Recycled Content: Preference will be given to manufacturer's recycling reclaimed carpet tile backing into new carpet tile, thus backing to backing.
  - (iii) Carpet Disassembly and Recycling: Carpet capable of disassembly and recycling, with nylon being recycled and backing being recycled into new backing.
  - (iv) Carpet product must meet guidelines of Presidential Executive Order 13101 and must meet the spirit of section 6002 of the Resource and Recovery Act (RCRA).
- (t) Sustainable Design Requirements:
- (i) Sustainable Product Certification: Gold level certification according to ANSI/NSF 140.
  - (ii) Carpet and cushion shall comply with testing and product requirements of Carpet & Rug Institute's "Green Label Plus" testing program.
- (u) Performance Characteristics:
- (i) Critical Radiant Flux Classification, Flooring Radiant Panel ASTM E 648: Not less than 0.45 W/sq. cm.
  - (ii) Smoke Density: Less than 450 per ASTM E662.
  - (iii) Methanamine Pill Test CPSC FF1-70: Must pass pill test.
  - (iv) Tuft Bind: Not less than **8 lbf (36 N)** according to ASTM D 1335.
  - (v) Delamination: Not less than **3.5 lbf/in. (0.6 N/mm)** according to ASTM D 3936.
  - (vi) Dimensional Tolerance: Within **1/32 inch (0.8 mm)** of specified size dimensions, as determined by physical measurement.
  - (vii) Dimensional Stability: 0.119 percent or less according to ISO 2551 (Aachen Test).
  - (viii) Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 129 and AATCC 164.
  - (ix) Colorfastness to Light: Not less than 4 after 60 AFU (AATCC fading units) according to AATCC 16, Option E.
  - (x) Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

## (2) INSTALLATION ACCESSORIES

- (a) Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

- (b) Trowelable Adhesives: Water-resistant, mildew-resistant, nonstaining, premium grade pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation using a premium pressure sensitive adhesive where slab moisture does not exceed 85 percent per ASTM F 2170 or 5 lbs (2.27 kg) per ASTM F 1869. Where slab moisture does not exceed 85 percent and antimicrobial protection is needed to pass AATCC 174, use a mill specified antimicrobial adhesive. Where moisture exceeds 85 percent or 5 lbs (2.27 kg) but does not exceed 90 percent or 10 lbs (4.56 kg), use a mill specified primer.
  - (i) Adhesives shall have a VOC content of [50] <Insert value> g/L or less.
  - (ii) Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
  - (iii) Adhesives shall comply with the testing and product requirements of the Carpet and Rug Institute Green Label Plus Program.
- (c) Non-Trowelable Adhesive: Water-resistant, mildew-resistant, non-staining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation using a non trowelable adhesive where slab moisture does not exceed 95 percent per ASTM F 2170 or 10 lbs (4.56 kg) per ASTM F 1869. Each carpet tile must be adhered to the subfloor.
- (d) Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

### 3) EXECUTION

#### (1) EXAMINATION

- (a) Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.
- (b) Examine carpet tile for type, color, pattern, and potential defects prior to installation. See manufacturer's requirements for substrate conditions and ambient conditions.
- (c) Concrete Slabs: Verify that finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
  - (i) Lightweight concrete and gypcrete subfloors may require a liquid latex primer to reduce surface porosity.

(ii) Where previous surface treatments are unknown, or where other concerns exist as to the ability of the adhesive to bond to the substrate, a 24-hour bond test is recommended.

(d) Wood Subfloors: Verify the following:

- (i) Underlayment over subfloor complies with requirements specified in Section 061600 "Sheathing."
- (ii) Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.
- (iii) Unfinished wood should be primed using a liquid latex primer.

(e) Metal Subfloors: Verify the following:

(i) Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.

(f) Painted Subfloors: Perform bond test recommended in writing by adhesive manufacturer.

(i) Access Flooring Systems: Verify the following:

- (ii) Access floor substrate is compatible with carpet tile and adhesive if any.
- (iii) Underlayment surface is flat, smooth, evenly planed, tightly jointed, and free of irregularities, gaps greater than [**1/8 inch (3 mm)**], protrusions more than **1/32 inch (0.8 mm)**, and substances that may interfere with adhesive bond or show through surface.

(g) Proceed with installation only after unsatisfactory conditions have been corrected.

## (2) PREPARATION

(a) General: Comply with Carpet & Rug Institute Installation Standard 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

(b) Use trowelable leveling and patching compounds that contain a cementitious base with a latex additive, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes, and depressions **1/8 inch (3 mm)** wide or wider, and protrusions more than **1/32 inch (0.8 mm)** unless more stringent requirements are required by manufacturer's written instructions.

(c) Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

(d) Metal Substrates: Clean grease, oil, soil, and rust, and prime if recommended in writing by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.

- (e) Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

### (3) INSTALLATION

- (a) General: Comply with CRI's "Carpet & Rug Institute Installation Standard 104, "Modular Carpet" and with carpet tile manufacturer's written installation instructions.
- (b) Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive. Any non-spreadable adhesive system must adhere the carpet to the substrate.
- (c) Maintain dye-lot integrity. Do not mix dye lots in same area unless the specific carpet style is manufactured as a merge-able dye lot product.
- (d) Maintain pile-direction patterns as recommended in writing by carpet tile manufacturer.
- (e) Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosing. Bind or seal cut edges as recommended by carpet tile manufacturer.
- (f) Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- (g) Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.
- (h) Install pattern parallel to walls and borders.
- (i) Roll the entire installation with a 75 lb. roller once installation is completed.
- (j) Access Flooring: Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

### (4) CLEANING AND PROTECTION

- (a) Perform the following operations immediately after installing carpet tile:
  - (i) Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
  - (ii) Remove yarns that protrude from carpet tile surface.
  - (iii) Vacuum carpet tile using commercial machine with face-beater element.
- (b) Protect installed carpet tile to comply with Carpet & Rug Institute Installation Standard 104, "Protecting Indoor Installations."

- (c) When construction or move-in activities will continue where new carpet is installed, provide non-staining building material paper to protect carpet. Do not use plastic sheeting as it can trap moisture, and self-sticking plastic sheeting can transfer adhesive residue to carpet that will attract soil.
- (d) When heavy objects are moved over carpet within 24 hours of installation, use plywood over carpet to prevent buckling and wrinkling.
- (e) Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

9B-05.        RUBBER BASE:

Where noted, base shall be 4" high **rubber** base equal to Roppe or Johnsonite. **Internal and external corners shall be premolded.** Apply with full bed of mastic so base adheres uniformly to wall surface. Color to be selected by Architect.

9B-06.        GUARANTEES:

This Contractor shall furnish a 2-Year Guarantee for workmanship and installation and defective materials for the installation of all the floor covering specified in this section, and in addition, shall furnish a 10-Year Warranty from the carpet manufacturer for delamination, edge ravel and excessive wear. Guarantees to be dated date of acceptance of building.

**END OF SECTION.**

## SECTION 9D

### ACOUSTICAL TREATMENT

#### 9D-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

#### 9D-02. SCOPE:

The work to be done under this heading includes the furnishing of all labor, equipment, services, and materials necessary for, or reasonably incidental to, making a complete installation of the suspended acoustical tile ceilings in strict accordance with these specifications and/or as indicated on the drawings. No deviation from these specifications shall be allowed unless approved by the Architect in writing prior to bid date. All acoustical materials and suspension systems shall be installed by a subcontractor thoroughly experienced in this type of work and approved by the manufacturer. **It shall be the responsibility of the acoustical contractor to provide adequate support for the light fixtures and it shall be this contractor's responsibility to coordinate his work with the electrical and mechanical contractors. This contractor is to arrange for adequate anchorage to the frame system.**

#### 9D-03. NON-BEVELED EDGE SUSPENDED GRID LAY IN TILE CEILING SYSTEM:

A. Grid System: Shall be Prelude XL 15/16" suspended exposed tee grid as manufactured by Armstrong World Industries, Inc.

1. Components: All main beams and cross tees shall be commercial - quality hot dipped galvanized steel. Exposed surfaces chemically cleansed, capping prefinished in baked polyester pain. Main beams and cross tees are double-web steel construction with 15/16" type exposed flange design column strength and staked-on end detail allowing easy cross tee removal and remounting. Main beams shall be 1 1/2" spaced not more than 4'0" o.c. Cross tees shall be 1 1/2". Wall molding shall be #7800 with 1/2" exposed flange. Hanger wire shall be 12-gauge galvanized carbon steel.
2. Finish: All steel roll-formed parts, including cap, shall be chemically cleansed. Capping shall be prefinished in a baked polyester paint finish. Color shall be WHITE and match the actual color of the selected ceiling tile, unless other specified. Off white not acceptable.

B. Ceiling Lay-in Tile Units:

- 1 Lay-in tile units shall be Armstrong Mineral Fiber Ceiling Tile Units, Georgian #764 Pattern with and exposed grid system, Humiguard Plus, 24" x 24" x 5/8". Tile units shall be Class "A". Have a light reflectance of LR-1 (over 75%), and N.R.C. range of .50-.60, and an STC range of 35-29.

9D-04. BEVELED EDGE SUSPENDED GRID LAY IN TILE CEILING SYSTEM:

N.A.

9D-05. KITCHEN ZONE, SUSPENDED GRID LAY IN TILE CEILING SYSTEM:

A. Grid System: Shall be Prelude XL 15/16" suspended exposed tee grid as manufactured by Armstrong World Industries, Inc.

1. Components: All main beams and cross tees shall be commercial - quality hot dipped galvanized steel. Exposed surfaces chemically cleansed, capping prefinished in baked polyester pain. Main beams and cross tees are double-web steel construction with 15/16" type exposed flange design column strength and staked-on end detail allowing easy cross tee removal and remounting. Main beams shall be 1 ½" spaced not more than 4'0" o.c. Cross tees shall be 1 ½". Wall molding shall be #7800 with ⅞" exposed flange. Hanger wire shall be 12-gauge galvanized carbon steel.
2. Finish: All steel roll-formed parts, including cap, shall be chemically cleansed. Capping shall be prefinished in a baked polyester paint finish. Color shall be WHITE and match the actual color of the selected ceiling tile, unless other specified. Off white not acceptable.

B. Ceiling Lay-in Tile Units:

- 1 Lay-in tile units shall be Armstrong Kitchen Zone, Smooth Texture Square Lay-in Tile #673, 24" x 24" x \_" with the following characteristics:

Acoustical Performance	CAC Rating 33
Fire Rating	Class A
Light Reflectance	0.89
Anti-Mold & Mildew	Bio-Block High Level of Performance
Sag Resistance	Humi Guard High level of Performance
VOC Emissions	Certified Low Level
Durability	Water Repel. Scratch Resistant, Soil Buildup Resistant, & Washable
Warranty	30 years

9D-06. ACOUSTICAL CEILING TILE TRIM: N.A.

9D-07. INSTALLATION AND COORDINATION:

Main "T" runners shall be of not more than 48" centers and supported by 12-gauge wire to joist or structural system members (no hanging from ducts, piping, etc.); use unistrut members where required. Each corner of light fixture shall also be supported by hanger wires. "T" spline intersecting moldings shall be locked in place. All runners and splines shall be straight or in alignment and flush at intersections. **Edge molding shall be mitered at all corners, internal and external.**

Exterior doors shall be hung and all doors and windows glazed and all wet work completely dry

before starting this work. Areas shall be broom clean before proceeding with this work.

The contractor shall extend complete coordination to and with the mechanical and electrical contractors in coordination of the work. Tile shall be centered one room and lighting fixtures, and ceiling grilles shall be centered in tiles. A reflected ceiling plan is included in the architectural drawings and it is the responsibility of the ceiling sub- contractor to verify their accuracy and to bring to the Architect's attention any areas that will create shifting of grid or mechanical or electrical items.

9D-08.        EXTRA TILE:

The Ceiling Contractor shall upon completion of the work, leave a replacement supply of 400 SF of each type of tile. Extra tile is in addition to any tile used for replacing damaged or marred tile caused during construction or designated to replace from the Final Inspection.

9D-09.        ACOUSTICAL WALL PANELS: N.A.

9D-10.        ACOUSTICAL BARREL DIFFUSERS        N.A.

9D-11.        CLEAN-UP:

The Contractor shall remove all debris, scrap, etc., from the site upon completion of his work. Tile shall be free of finger prints, smudges, and present a uniform color, clean and level. Any tile found to contain smudges, chips, etc., shall be removed and replaced with new tile.

9D-12.        GUARANTEE:

This contractor shall guarantee in writing the materials and workmanship for a period of two (2) years after final acceptance of the building.

**END OF SECTION.**

## **SECTION 9E**

### **PAINTING**

#### 9E-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

#### 9E-02. SCOPE:

Furnish all labor, materials, equipment, and services necessary and/or incidental to all painting and decorating under this Contract.

In general, but not limited to, this contractor will include:

- A. Three (3) coats of paint on all new work exterior and interior, including plaster, stucco, sheetrock, block masonry walls, trim, and metal.
- B. Finishing of all cabinet work and paneling except that which is covered by plastic laminate or that which is finished at the mill.
- C. Epoxy coating of all walls and ceilings where called for on the schedule.
- D. Painting of concrete floors where called for on the drawings.

#### 9E-03. GENERAL REQUIREMENTS:

Mix all paints at least seventy-two (72) hours before using, keeping the containers covered during this period. Mix well before using. All paint is to come to the job in its original containers and to be Sherwin- Williams, ICI Coatings, Pittsburgh, or Pratt and Lambert.

The painter will mix samples of stains and colors and have the architect's approval before applying. All surfaces to receive paint, varnish, etc., shall be clean, smooth, free from dust and scratches, and to be thoroughly dry before applying paint.

The edges, including the top and bottom edges of all doors that are painted at the job site, shall be finished as called for and shall be touched up after the carpenter has made the final adjustments.

No paint shall be applied to wet or damp surfaces, nor shall any paint be applied to any surface when the temperature is below 50 degrees F.

All painting and decorating are to be done by experienced workmen, and the finished work shall be free from runs, sags, scratches, and brush marks and shall be uniform in color.

Application of paint by spray is not allowed other than glaze or multicolor coats as called for. All wood and trim are to be painted by brush only.

9E-04.        APPLICATION:

- A.    No coat shall be applied until the preceding one is thoroughly dry, and no paint shall be applied when temperature is 50 degrees F., or below, or when surfaces are damp. All paint shall be evenly spread and well brushed or sprayed as noted, or so as to accomplish best results. All paints, stains, etc., shall be mixed and applied according to manufacturer's directions, and each coat shall be sanded as required before the succeeding coat is applied.
- B.    All raw spots of wood frames, interior millwork, to be primed at mill shall be touched up with similar material immediately after being placed. All knots, sap, and pitch streaks shall be brush coated with shellac before priming coat is applied. Prime all wood which is to be covered with metal unless same has been treated with wood preserver.
- C.    Concrete masonry walls where called for to be painted shall be first examined for excess mortar, pointing up of joints, etc.
- D.    All rust spots, scratches, blemishes, etc., on metal door frames and exposed metal work through the building, shall be worked to the base metal with steel wool, the spots primed, and when dry.
- E.    Natural finish wood doors surfaces to be sanded with #320 wet or dry paper and rubbed with 4/0 steel wool between each coat.
- F.    Epoxy Coating Finish: Where called for on the finish schedule, epoxy coating shall be as per Paragraph 16-11, this section.

9E-05.        PUTTYING:

After the priming coat has been applied, all nail holes and voids of any kind are to be puttied flush with the surfaces. Excess putty shall be removed from the surfaces before succeeding coats of paint are applied.

9E-06.        EXTERIOR PAINTING:

- A.    All exposed metal, trim, frames, doors, miscellaneous steel and iron, galvanized iron:
  - 1.    One Coat Primer: ICI Devoe Coatings DevGuard 4160 Multi-Purpose Tank and Structural Primer or one coat of Sherwin Williams Kerm Kromik Metal Primer and one coat of Sherwin Williams Galvite for Galvanized Irons.
  - 2.    Two Coats Finish: ICI Devoe Coatings DevGuard 4308 Alkyd Gloss Enamel. Or two coats of Sherwin Williams Industrial Enamel B-54.
- B.    All exposed wood and wood trim:
  - 1.    One Coat Primer: ICI Ultra-Hide Durus 2110 Exterior Alkyd Primecoat or one coat of Sherwin Williams A-100 Primer.
  - 2.    Two Coats Finish: ICI Dulux Professional 2402 Exterior 100% Acrylic Satin Finish or Sherwin Williams K33W100 Satin Latex House.

- C. Exposed concrete block, concrete, and cement stucco:
1. One Coat Primer: (for concrete block only) ICI Ultra-Hide 3010-1200, Interior Exterior Vinyl Acrylic Block Filler or Sherwin Williams Heavy Duty Acrylic Block Filler B42W46.
  2. Two Coats Finish: ICI Dulux Professional 2402 Exterior 100% Acrylic Satin Finish or Sherwin Williams A24W351 Satin Latex House Paint.

9E-07. INTERIOR PAINTING:

- A. Exposed Iron and Steel Metals:
1. One Coat Primer: ICI Ultra-Hide 1120-1200 Oil / Alkyd Interior Enamel Undercoater or Sherwin Williams Kem Kromik Metal Primer.
  2. Two Coats Finish: ICI Ultra-Hide 1416 Latex Semi-Gloss Interior Wall and Trim Enamel or two coats Sherwin Williams Promar 200 Latex Semi-Gloss Enamel.
- B. Wood Trim (other than natural finish):
1. One Coat Primer: ICI Ultra-Hide 1120-1200 Oil / Alkyd Interior Enamel Undercoater or Sherwin Williams Classic Wall and Wood Primer B28-W101.
  2. Two Coats Finish: ICI Ultra-Hide 1416 Latex Semi-Gloss Interior Wall and Trim Enamel or Sherwin Williams Promar B-31 200 Semi-Gloss.
- C. Sheetrock Walls:
1. One Coat Primer: ICI Ultra-Hide 1030-1200 PVA Interior Primer Sealer or Sherwin Williams Promar 200 Series B-28.
  2. Two Coats Finish: ICI Ultra-Hide 1412 Latex Eggshell Interior Wall and Trim or Sherwin Williams Promar 200 Latex Semi-Gloss Enamel B-31.
- D. Exposed Masonry Block:
1. One Coat Primer: ICI Ultra-Hide 3010-1200 Interior / Exterior Vinyl Acrylic Blockfiller or Sherwin Williams Heavy Duty Acrylic Block Filler B42W46.
  2. Two Coats Finish: ICI Ultra-Hide 1412 Latex Eggshell Interior Wall and Trim Enamel or Sherwin Williams Promar 200 Latex Semi-Gloss Enamel B-31.
- E. Epoxy Coating Finish: Where called for on the finish schedule, epoxy coating shall be as per Paragraph 16-11, this section.

9E-08. NATURAL FINISH:

- A. Where selected or called for on wood trim or doors or millwork items:

1. One coat of Lacquer Sealer and two coats of Gloss Lacquer or two coats of ICI Woodpride 1902 Interior Polyurethane High Gloss Varnish.

9E-09. STAINED FINISH:

A. Where selected or called for on wood trim or wood doors or millwork items:

1. One Coat: ICI Woodpride 1900 Interior Oil Wood Finishing Stain or one coat of Olympic Clear Interior Stain.
2. One Coat: Lacquer Sealer or Sanding Sealer Well Sanded.
3. Two Coats: ICI Woodpride 1902 Interior Polyurethane High Gloss Varnish or two coats of Gloss Lacquer.

9E-10. PAINTED CONCRETE FLOORS: N.A.

9E-11. EPOXY COATING FINISH: N.A.

9E-12. SANDING AND FINISHING:

It will be the responsibility of the painting contractor to hand sand all surfaces to be painted and otherwise prepare them to provide a smooth finish paint job. All corners to be "eased", nail holes filled and painted surfaces prepared and approved after prime coat is applied. The second coat of paint must be completed and approved before final coat is started in any area. Repainting of any area required because of poor coverage, sags, voids, poorly prepared surfaces, etc., will require the repainting of the entire wall area. No patch painting will be accepted.

9E-13. APPLICATION OF COATS:

Work shall be limited to specific areas of construction to facilitate inspection and progress, and no succeeding coat will be applied in any area until the prime coat or first coat has been inspected and approved for the entire area.

Prime coat will be white. Second coat tinted toward color, and final coat from can in color selected.

9E-14. SUBMITTAL:

Painting contractor to submit technical information for the various types of paint used along with color sample box for color selection.

9E-15. GUARANTEE:

Painting contractor shall guarantee in writing his material and application for a period of one year from date of acceptance of building.

**END OF SECTION.**

## SECTION 9F

### DRYWALL SYSTEM

#### 9F-01. GENERAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

#### 9F-02. SCOPE:

Furnish all labor, materials and equipment and perform all operations necessary for the complete installation of all metal studs and drywall applications as noted in these Specifications and as shown on the Drawings.

#### 9F-03. GENERAL:

Screw stud system shall be generally for single layer of  $\frac{5}{8}$ " fireguard sheetrock, or  $\frac{5}{8}$ " sheetrock in interior walls,  $\frac{1}{2}$ " exterior plywood or exterior gypsum board for backing for E.I.F. system, or for thermoply and backing for face brick. Steel stud system shall be equal to 3  $\frac{5}{8}$ " and 6" screw stud system as manufactured by U.S. Gypsum Company. Note drawings for other special wall thicknesses. All studs shall be galvanized steel and spaced 16" o.c.

#### 9F-04. MATERIALS:

1. Studs - 3  $\frac{5}{8}$ ", 6" or 8" where shown. 16 gauge at door jambs and head. 20 gauge where used for framing for interior walls or where drawings indicate. 18 gauge where framing at exterior walls. Walls above or below window and door openings and for any framing where connections are welded if not indicated heavier shall be 18 gauge.
2. Runners - Sized for studs 22 gauge.
3. Face Boards -  $\frac{5}{8}$ " " fire guard where noted (see drawings for double layers), and  $\frac{5}{8}$ " " regular for other partition walls. Where ceramic tile is called for on metal stud construction wall boards shall be  $\frac{1}{2}$ " Durock Board as manufactured by U.S. Gypsum.
4. Fasteners - USG screws of required length.
5. Joint Treatment - tape regular and flex tape.
6. Z galvanized metal furring strips  $\frac{3}{4}$ " and 1".
7.  $\frac{3}{4}$ " E.P.S. insulation board.
8. Galvanized hat channels (see drawings for sizes).
9. Galvanized corner beads. Galvanized "J" molding at all face ends

10. Sheetrock equal to National Gypsum Co. Wallboards  $\frac{5}{8}$ " thick fire guard for all rated walls,  $\frac{5}{8}$ " thick for interior walls and for ceilings where called for.
11. See EIFS section for exterior EIFS sheathing.

9F-05. INSTALLATION:

A. Exterior Framing:

1. Studs and Runners:
  - a. Align runners accurately according to exterior wall layout and secure to base and head with power-driven fastener spaced 16" o.c.
  - b. Position studs vertically in runners at floor and ceiling to structural elements with suitable fasteners located 2" from each end and spaced 24" o.c., or to suspended ceilings with toggle bolts or hollow wall anchors spaced 16" o.c.
  - c. Exterior block wall furring strips to be installed 2'0" o.c. with  $\frac{3}{4}$ " E.P.S. Board positioned tightly between the furring strips. Furring strips to be secured to block walls with power driven fasteners spaced no further than 16" o.c.

B. Interior Walls:

1. Stud System Erection: Attached steel runners at floor and ceiling to structural elements with suitable fasteners located 2" from each end and spaced 24" o.c., or to suspended ceilings with toggle bolts or hollow wall anchors spaced 16" o.c.

Position studs vertically, with open side facing in same direction, engaging floor and ceiling runners, and spaced 16" o.c. When necessary, splice studs with 8" nested lap and two positive attachments per stud flange. Place studs in direct contact with all door frame jambs, abutting partitions, partitions corners and existing construction elements. here studs are installed directly against exterior walls, and a possibility of water penetration through walls exists, install asphalt felt strips between studs and wall surface.

Anchor all studs for shelf-walls and those adjacent to door and window frames, partition intersections, corners and free-standing furring to ceiling and floor runner flanges with USG Metal Lock Fastener tool or screws. Securely anchor studs to jamb and head anchor clips of door or borrowed-light frames by bold or screw attachment. Over metal door and borrowed-light frames, placed horizontally a cut-to length section of runner, with a web-flange bend at each end, and secure to strut-studs with two screws in each bent web. Position a cut-to-length stud (extending to ceiling runner) at vertical panel joints over door frame header.

2. Gypsum Panel Erection: Apply gypsum panels perpendicular to studs. Position all edges over studs for parallel application; all ends over studs for perpendicular application. Use maximum practical lengths to minimize end joints. Fit ends and

edges closely, but not forced together. Stagger joints on opposite sides of partition.

For one hour rated walls between units, screw size and spacing shall be in accordance to requirement for a one-hour rating.

For single-layer parallel application of gypsum panels, space screws 16" o.c. in field of panels and along vertical abutting edges. For perpendicular panel application, space screws 16" o.c. in field and along abutting end joints. For double-layer screw attachment, space screws 24" o.c. in base layer and 16" o.c. in face layer. Apply both layers of gypsum panels vertically with joints in face layer offset from base layer joints. For ½" and ⅝" panels, use 1" screws for base layer and 1- ⅝" screws for face layer.

For stud walls where ceramic tile is called for ½" Durock Board shall be installed in accordance with ATC. All joints shall be properly taped and the contractor shall inspect application of wall board for proper secureness to see that all joints of the wall board occur at wall anchored studs. All joints to be taped full length of cement board.

3. Chase Wall Erection: Align two parallel rows of floor and ceiling runners spaced apart as detailed. Attach to concrete slabs with concrete stud nails or power-driven anchors 24" o.c. to suspended ceilings with toggle bolts 16" o.c., or to wood framing with suitable fasteners 24" o.c.

Position steel studs vertically in runners, 16" o.c. with flanges in the same direction, and with studs on opposite sides of chase directly across from each other. Anchor all studs to floor and ceiling runner flanges with USG Metal Lock Fastener tool or screws.

Cut cross bracing to be placed between rows of studs from gypsum panels, 12" high by chase wall width. Space braces 48" o.c. vertically and attach to stud webs with six (6) 1" Type S Screws per brace. If larger braces are used, space screws 8" o.c. max. On each side.

Bracing of 2- ½" steel studs may be used in place of gypsum panels. Anchor web at each end of steel brace to stud web with two (2) ⅝" pan head screws. When chase wall studs are not opposite, install steel stud cross braces 24" o.c. horizontally and securely anchor each end to a continuous horizontal 2- ½" runner screw-attached to chase wall studs within the cavity.

- C. Finishing: Gypsum board shall be finished according to manufacturer's recommendations with a complete system of taping, joint compound, sanding, etc. Use pre-fabricated outside and inside corner metal reinforcement. Joints, nails or other imperfections that are visible will be cause for rejection. Use "J" molding at all sheetrock panel ends.

**END OF SECTION.**

## SECTION 9G

### EXTERIOR INSULATION FINISH SYSTEM (E.I.F.S.)

#### 9C-01. GENERAL AND SPECIAL CONDITIONS:

The General and Special Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

#### 9C-02. SCOPE:

The Contractor shall furnish all labor, materials, and equipment to complete the installation of the synthetic exterior insulation finish system as shown on the drawings and as specified in these specifications.

#### 9C-03. QUALIFICATIONS:

Application shall be by qualified subcontractor and shall be able to present evidence of past projects using material submitted with name of project, date, location, and General Contractor name and phone number.

#### 9C-04. MATERIALS:

- A. General: Specifications are written around Sto Industries Incorporated Specifications. The Architect will consider substitutions for brand names of equal products.  
**Procedures for substituting shall be as per specifications, Instructions to Bidders, Paragraph B-5.**
- B. System: Shall be Sto. System One Specification A-9C0 for application over stud wall construction and Specification A-200 for installation over concrete block walls. Equal systems by Senergy (Senerflex System) and / or Finestone are acceptable. All others are to be treated as above for substitutions.
- C. Surface Preparation:
- Sto Grundex - a deep penetrating, solvent-based substrate hardener and sealer, as manufactured by STO Industries, Inc.
- Sto Plex - a solvent-based surface sealer and adhesion intermediary, as manufactured by STO Industries, Inc.
- D. Adhesive:
1. STO ADH - a copolymer-based adhesive and leveler as manufactured by STO Industries, Inc., mixed 1:1 with Type 1 Portland Cement.
  2. STO BTS-A (Alternate Adhesive) - a copolymer-based adhesive as manufactured by STO Industries, Inc., mixed with 20% by weight of Type 1

Portland Cement. Use where maximum flexibility is required. Because of its low cement content, interaction is minimized and flexibility maximized.

3. STO BTS-B - a polymer-based ground coat and leveler when mixed with 7-9C quarts of clean water.
  4. Where applied on stud wall construction - STO DISPERSION ADHESIVE -a non-cementitious, ready-mixed 9C0% acrylic copolymer emulsion-based adhesive that is waterproof and vapor permeable, as manufactured by STO Industries, Inc.
- E. Insulation Board: Expanded Polystyrene (EPS Board) less than 25 flame spread, 1.0 lbs./cu. ft. average density; U=0.26 per inch; ASTM C578-85 Class A. Thickness shall be generally 1" as shown or 1½" or greater where shown. Maximum size of EPS shall not exceed 2' x 4', board shall be manufactured by licensed EPS molder and each board shall bear identification mark. Insulation board shall be grooved on the backside to allow water to drain.
- F. E.I.F. System Sheathing: Shall be ½" DENS-Glas Gold sheetrock backing manufactured by Georgia Pacific.
- G. Ground Coat:
1. STO RFP - a ready-mixed, noncementitious, 9C0% acrylic copolymer emulsion-based, water resistant, vapor permeable, glass fiber reinforced non-capillary action ground coat. Tint same shade as finish.
  2. STO BTS-A - a copolymer-based ground coat and leveler when mixed with 20% Type 1 Portland Cement by weight. Prior to application of any STO finish over STO BTS-A, STO PRIMER shall be applied as an adhesion intermediary providing water resistance. Tint to the same shade as finish.
  3. STO BTS-B - a polymer-based ground coat and leveler.
- H. Fabric:
1. On all surfaces **6 Ft above finish floor level and above**, fabric shall be STO REINFORCING FIBER MESH, with symmetrical interlaced glass fiber made from twisted multi-end strands, styrene butadiene coated at least 20 grams per square yard to provide a shift proof and alkaline resistant mesh compatible with STO materials.
  2. On all surfaces **6 FT above finish floor level and below**, fabric shall be STO ARMOR MAT, heavy duty, double strand, interwoven glass fiber mesh specifically coated for compatibility with STO materials.
- I. Finish: Shall be STO EXTERIOR STOLIT .75 ready-mixed acrylic based wall coating. Architect shall select type, colors, and aggregate size.

9C-05. INSTALLATION:

- A. Installations shall be performed by and/or supervised by Certified Applicators.

Under no circumstances shall any of the products be altered by adding any additives,  
9G-2 EIFS

except for small amounts of clean water as directed on label; or when using STO PLEX. Antifreeze, accelerators, rapid binders, etc., are not acceptable.

- B. The surface to receive the Full Thermal System shall be structurally sound, clean, dry, and uniform. If the surface of the wood sheathing has weathered or the factory applied seal on gyp sheathing has been exposed longer than the gyp sheathing manufacturer's recommendations, then prime the entire surface with STO PLEX.

For masonry application:

- For leveling of irregularities, STO, ADH, STO BTS-A or STO BTS-B shall be used. For excessive amounts of leveling, use a 2:1:6 Portland: lime/sand mixture.
- For sanded surfaces of old plaster, masonry and concrete, seal surface with STO GRUNDEX.
- For efflorescence, remove with a diluted acid wash or appropriate means.
- Form release agents and other residue must be removed by appropriate means.

- C. A starter strip of STO REINFORCING FIBER MESH shall be applied to the wall at the base line using STO ADH, STO BTS-A or STO BTS-B prior to installation of the EPS Board. It shall be wide enough to adhere 4" of mesh onto the wall, be able to wrap around the board edge and cover approximately 4" on the outside surface of the EPS Board. This procedure shall be followed at all exposed EPS Board edges as per STO details (example - window and door heads and jambs).

Use STO DISPERSION ADHESIVE on stud wall application.

- D. Masonry: Use STO ADH to adhere EPS Boards to substrate. Mix STO ADH, STO BTS-A or STO BTS-B according to manufacturer's recommendations. Apply the adhesive to the back of the EPS Boards using a ½ " notched trowel Ribbons of adhesive shall be uniform and run horizontal with the building walls.

Stud Wall Application: Apply STO DISPERSION ADHESIVE to the back of the EPS Boards using a 3/16" u-notched trowel. Ribbons of adhesive should be uniform and run horizontal with the building walls.

- E. The EPS Boards shall be placed horizontally on the walls starting from a level base line. Stagger vertical joints and interlock EPS Boards at all inside and outside corners. Apply firm pressure over entire surface of the boards to insure uniform contact. Sufficient pressure shall be applied to flatten the ribbons of adhesive to result in a minimum of 50% adhesion. All joints shall be butted tightly together to eliminate any thermal breaks in the STO Full Thermal System. Keep any adhesive from getting between the joints of the EPS Boards. Adhesive shall have adequate curing time before any further work can be done over the EPS Boards. All open joints in the EPS Board layer shall be filled with slivers of EPS Board or an approved spray foam.

**The use of nails, screws, or any other type of non-thermal mechanical fasteners is not acceptable.**

Rasping of the EPS Board surface shall be required to achieve a smooth, even surface and remove possible ultraviolet ray damage.

Use of plastic or metal corner beads, stop beads, etc., will not be acceptable.

- F. **All areas where the Full Thermal System meets dissimilar material or terminates shall have the EPS Boards cut back from the adjoining material a minimum of ¼" to form a caulk joint and sealed (caulked) so that no water can penetrate through or behind the system.** Prior to sealing (caulking), all EPS Boards edges shall be coated with STO RFP, STO BTS-A or STO BTS-B and STO PRIMER. Application to be allowed to dry before sealing (caulking).
- G. Mixing and preparation of finish material shall be in strict accordance to manufacturer's directions. Apply a ground coat of STO RFP over EPS Board using proper spray equipment or a stainless-steel trowel to a uniform thickness of approximately 1/16". Work horizontally or vertically in strips of 40 inches, and immediately embed the STO REINFORCING FIBER MESH into the wet ground coat.
- STO REINFORCING FIBER MESH shall be double wrapped at all corners and overlapped not less than 2½" at mesh joints. Avoid wrinkles in the mesh.** The finish thickness of the ground coat shall be such that the STO REINFORCING FIBER MESH is fully imbedded. Allow ground coat to thoroughly dry before applying finish.
- H. Caulking: Install backer rod (25% compression) in caulk joint openings to provide a depth equal to the width of the joint. Install a STO approved caulk and tool flush with the ground coat surface. Allow caulk to set per manufacturer's specifications prior to applying the STO finish coat. **(See Paragraph "F" above)**
- Caulking shall be in strict conformance to the manufacturer's details and shall be installed at all places where the EIFS abuts a dissimilar material. Caulking shall be installed to make for a neat and professional job.
- I. The STO finish, a ready-mixed acrylic-based wall coating shall be applied directly over the STO RFP ground coat or over primed STO BTS-A or STO BTS-B ground coat **ONLY AFTER THE GROUND COAT HAS THOROUGHLY DRIED.** Finish shall be applied by spraying, rolling, or troweling using a stainless-steel trowel.

9C-06. SOFFIT VENTS:

See "Miscellaneous Metals and Specialties" for soffit vents to be installed as per drawings.

9C-07 SUBMITTAL:

Contractor shall submit shop drawings which will include specifications noting type of materials to be used, manufacturer's details, and color charts for color selection. Colors will be selected from the manufacturer's standard color chart. Along with color chart contractor shall submit an 8"x 9C" sample of finish and color.

9C-08. WARRANTY:

Manufacturer's warranty shall be furnished guaranteeing in writing that the materials are free from defects and the workmanship for a period of five (5) years.

9C-09. CLEANING:

The Contractor shall be responsible for cleaning all surfaces of excess finish material and removal of all equipment and unused material and debris from his operation from the site.

**END OF SECTION.**

## SECTION 10A

### MISCELLANEOUS SPECIALTIES

#### 10A-01. GENERAL CONDITIONS:

The General Conditions, Division II, Sections E and F of these specifications shall apply to and form a part of this Section as if written in full herein.

#### 10A-02. SCOPE:

Work under this heading includes necessary labor and materials required to install items listed in this Section or shown on the contract drawings.

#### 10A-03. ACCESS PANELS AND DOORS:

Access panels for access to mechanical or electrical items shall be furnished to the general contractor by the respective subcontractor and installation shall be by the General Contractor.

All other areas which require access, access panels shall be furnished and installed by the General Contractor. Doors shall be suitable for wall or ceiling finish involved. Opening size shall be as required or as indicated and fire rated where rated walls or ceilings are penetrated. Units shall be equal to those manufactured by Milcor, Philip Carey, Zurn, or other approved equal.

#### 10A-04. PAIRED OPERABLE PARTITION: N.A.

#### 10A-05. ALUMINUM LETTERS:

- A Furnish and install where shown on exterior of building letters equal to A.R.K. Ramos, Oklahoma City, OK: 405/235/5505. Letters shall be sized as shown on the drawings and shall be cast aluminum Helvetica Medium No. 521, all upper-case letters. All letters will be projected mounted PM-1.
- B Letters shall be as follows: As Shown on Drawings
  - a. **Finish shall be Black Anodized**
- C Furnish shop drawings for approval and manufacturer to furnish contractor with paper template for installation.

10A-06. ALUMINUM PLAQUE:

- A. The Contractor shall include in his bid, the cost for the furnishing and installation of an aluminum plaque. Plaque shall be manufactured by A.R.K. Ramos Company, Oklahoma City, OK.
- B. Size of plaque to be **approximately** 20" wide x 30" tall and will include the following:

<b>Project Title:</b>	<b>New Municipal Police Department Office Building</b>
	<b>City of Cottondale</b>
<b>Project Date:</b>	
<b>City Commissioners' Names (5):</b>	<b>James Elmore, Mayor</b>
	<b>Curtis Benefield</b>
	<b>Dennis Sloan</b>
	<b>Ty Daniels</b>
	<b>Jarrard Deese</b>
<b>Architect's Firm Name:</b>	<b>Donofro Architects Marianna, Florida</b>
<b>Program Manager</b>	<b>DHM Melvin Engineering Marianna, Florida</b>
<b>General Contractor's Name:</b>	<b>T.B.D.</b>

- C. Plaque will contain both raised and engraved letters. Where engraved, background will be polished aluminum, where raised and polished, background will be Black Pebble Finish. Mounting will be by concealed method. Design of plaque to be furnished by the Architect. Shop drawings will be required for approval prior to casting.

10A-07. ALUMINUM SHIPS LADDER: N.A.

10A-07. ALUMINUM THRESHOLDS:

See Finish Hardware Section, these specifications. All thresholds to be set in full bed of mastic.

10A-08. ALUMINUM & STEEL MISCELLANEOUS SHAPES:

Furnish and install all aluminum or steel angles, channels, break metal shapes, in sizes and shapes and at locations as shown on drawings, or as required for support, bracing, anchoring, etc. of incidental items whether shown or not.

10A-09. BATHROOM ACCESSORIES:

Furnish and install the following accessories in locations as stated. Exact locations will be as directed by Architect.

A. Accessories:

1. Surface Mounted Paper Towel Dispenser: To be Bobrick Model #B262 Commercial stainless steel, surface-mounted towel dispenser. Quantity required: three (3).
2. Mirrors: Bobrick Model #165-2430 satin finish stainless steel frame. All welded construction. 18 gauge wall hanger and theft-resistant mounting bracket. 24" x 30" or sizes as shown on the interior elevations and drawings. Quantity required: Two (2).
3. Toilet Tissue Holder: Bobrick Model #B-2888 Commercial, surface-mounted toilet paper dispenser, stainless steel with satin finish. Quantity required: Two (2).
4. Grab Bars: Bradley 1 ½" O.D., S.S. Series 812, sanitary safe grey finish 059 configuration and 001 configuration grab bar installation for concealed mounting. Quantity required: Two (2) at water closets and One (1) at shower.
5. Folding Shower Seat: Shower seat equal to heavy hardware model #19071; folding ADA compliant shower seat with stainless steel frame and phenolic plastic seat designed to support 250 lbs. Frame is to be fabricated from 304 grade stainless steel with US32D brushed stainless steel finish.
6. Mop Holder: N.A.
7. Baby Diaper Changing Station: N.A.
8. Electric Hand Dryers: N.A.

10A-10. CHAIN LINK FENCE: See the Civil drawings and specifications.

10A-11. FIRE EXTINGUISHERS:

Furnish and install at locations shown, or noted on the drawings, 10 lb. capacity fire extinguishers equal to "J L Industries Cosmic 10E A B C with U.L. rating 4A-60BC.

Provide complete with metal hanger. Exact location will be as directed by Architect. Mounting height to be so top of extinguisher not more than 5'-0" A.F.F. Prior to final inspection each extinguisher shall be inspected by the local fire inspector and tagged with inspection sticker showing unit fully charged, date and signature of inspector.

10A-12. HANDRAILS/ GUARDRAILS:

- A. Furnish and install powder coated steel pipe handrails and guardrails as shown, detailed and noted on the drawings. System shall be a completely welded system, all welds grounded smooth and fabricated of sections as noted and shown on the drawings.

- B. Shop drawings for handrails shall be submitted for approval prior to fabrication. General Contractor shall be responsible for furnishing, coordinating, and verifying all exact dimensions for proper fabrication of the handrail systems.

**Shop drawings for hand and guard rails shall be separate submittal and not included as part of the structural steel submittal.**

10A-13. HAT CHANNELS:

Furnish and install 1 ½" and ¾" galvanized hat channels for framing and installation of metal fascia and metal siding panels as shown and noted on the drawings. Light gauge framing for installation of fascia system shall be as shown on the drawings and specified in Section 11 of these specifications.

10A-14. MARKER BOARDS AND TACK BOARDS: N.A.

10A-15. MOP HOLDERS: N.A.

10A-16. PRECAST CONCRETE SILLS / WALL CAPS: N.A.

10A-17. SIGNAGE:

- A. Furnish and install plastic room signs adjacent to door frames as indicated on the door schedule
- B. Signs shall be 6 x 6 x ¼ MP and shall contain room number and room name, and raised braille copy. Numbers and names shall be engraved. All signs to be ADA compliant.

Type style shall be Helvetica Medium, finish of background shall be non-glare. Colors of letters and background will be as selected by Architect.

Signs for restrooms shall have separate integral handicapped pictorial insignia.

Room numbers and names will be furnished by Architect.

- C. Install door signs 60" A.F.F., to the centerline of the sign, on wall adjacent to latch side of door. Signs to be installed with stainless steel screws.
- D. See mechanical and electrical drawings and specifications for engraved signs located at exhaust fan switches and emergency cut offs. Signs to be red background, white letters. Signs to be installed for gas, water, electrical emergency cut off and for exhaust fans.
- E. Furnish shop drawings for approval, and color samples for color selection.

10A-18. SOLID PLASTIC TOILET PARTITIONS: N.A.

10A-19. KITCHEN AND LAUNDRY APPLIANCES:

**Item No 1** **GE® Series 31.8 Cu. Ft. Counter Depth Side x Side Refrigerator**

**Model #GZS221YNFS**

Size	69 1/2" H x 35 3/4" W x 30 3/4" Deep
Finish	Fingerprint Resistant Stainless
Lighting	Showcase LED
Drawers	3 Refrigerator Pull Out Drawers with Cleat Front
Shelve	Glass Freezer Shelves, Adjustable
Display	Electronic
Ice Maker	Automatic
Water Dispenser	External

**END OF SECTION**

## SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Form-facing material for cast-in-place concrete.
  - 2. Shoring, bracing, and anchoring.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each of the following:
  - 1. Exposed surface form-facing material.
  - 2. Concealed surface form-facing material.
  - 3. Form ties.
  - 4. Form-release agent.
- B. Shop Drawings: Prepared by, and signed and sealed by, a qualified professional engineer responsible for their preparation, detailing fabrication, assembly, and support of forms.
  - 1. For exposed vertical concrete walls, indicate dimensions and form tie locations.
  - 2. Indicate dimension and locations of construction and movement joints required to construct the structure in accordance with ACI 301.
    - a. Location of construction joints is subject to approval of the Architect.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Minutes of preinstallation conference.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Concrete Formwork: Design, engineer, erect, shore, brace, and maintain formwork, shores, and reshores in accordance with ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.

1. Design wood panel forms in accordance with APA's "Concrete Forming Design/Construction Guide."
2. Design formwork to limit deflection of form-facing material to 1/240 of center-to-center spacing of supports.
  - a. For architectural concrete specified in Section 033300 "Architectural Concrete," limit deflection of form-facing material, studs, and walers to 0.0025 times their respective clear spans (L/400).

## 2.2 FORM-FACING MATERIALS

### A. As-Cast Surface Form-Facing Material:

1. Provide continuous, true, and smooth concrete surfaces.
2. Furnish in largest practicable sizes to minimize number of joints.
3. Acceptable Materials: As required to comply with Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete, and as follows:
  - a. Plywood, metal, or other approved panel materials.
  - b. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
    - 1) APA MDO (medium-density overlay); mill-release agent treated and edge sealed.

### B. Concealed Surface Form-Facing Material: Lumber, plywood, metal, plastic, or another approved material.

1. Provide lumber dressed on at least two edges and one side for tight fit.

## 2.3 RELATED MATERIALS

- A. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- B. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- E. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
  1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
  2. Form release agent for form liners shall be acceptable to form liner manufacturer.

- F. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  - 1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
  - 2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.
  - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

## PART 3 - EXECUTION

### 3.1 INSTALLATION OF FORMWORK

- A. Comply with ACI 301.
- B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 and to comply with the Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete" for as-cast finishes and Section 033300 "Architectural Concrete".
- C. Limit concrete surface irregularities as follows:
  - 1. Surface Finish-2.0: ACI 117 Class B, 1/4 inch.
- D. Construct forms tight enough to prevent loss of concrete mortar.
  - 1. Minimize joints.
  - 2. Exposed Concrete: Symmetrically align joints in forms.
- E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.
  - 1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
  - 2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
  - 3. Install keyways, reglets, recesses, and other accessories, for easy removal.
- F. Do not use rust-stained, steel, form-facing material.
- G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.
  - 1. Provide and secure units to support screed strips.
  - 2. Use strike-off templates or compacting-type screeds.
- H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.
  - 1. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar.

2. Locate temporary openings in forms at inconspicuous locations.
- I. Chamfer exterior corners and edges of permanently exposed concrete.
  - J. At construction joints, overlap forms onto previously placed concrete not less than 12 inches.
  - K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.
    1. Determine sizes and locations from trades providing such items.
    2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.
  - L. Construction and Movement Joints:
    1. Construct joints true to line with faces perpendicular to surface plane of concrete.
    2. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
    3. Place joints perpendicular to main reinforcement.
    4. Locate joints for beams, slabs, joists, and girders in the middle third of spans.
      - a. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
    5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
    6. Space vertical joints in walls as indicated on Drawings.
      - a. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
  - M. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection.
    1. Locate ports and openings in bottom of vertical forms, in inconspicuous location, to allow flushing water to drain.
    2. Close temporary ports and openings with tight-fitting panels, flush with inside face of form, and neatly fitted, so joints will not be apparent in exposed concrete surfaces.
  - N. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
  - O. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
  - P. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.2 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.
  - 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
  - 3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
  - 4. Install dovetail anchor slots in concrete structures, as indicated on Drawings.
  - 5. Clean embedded items immediately prior to concrete placement.

### 3.3 SHORING AND RESHORING INSTALLATION

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
  - 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.
- B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

### 3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field inspections and prepare inspection reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
  - 1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.

END OF SECTION 031000

## SECTION 032000 - CONCRETE REINFORCING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Steel reinforcement bars.
  - 2. Welded-wire reinforcement.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Each type of steel reinforcement.
  - 2. Bar supports.
- B. Shop Drawings: Comply with ACI SP-066:
  - 1. Include placing drawings that detail fabrication, bending, and placement.
  - 2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
- C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.
  - 1. Location of construction joints is subject to approval of Architect.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
  - 1. Reinforcement to Be Welded: Welding procedure specification in accordance with AWS D1.4/D1.4M.
- B. Material Test Reports: For the following, from a qualified testing agency:
  - 1. Steel Reinforcement.
- C. Field quality-control reports.

## 1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D 1.4M.

## PART 2 - PRODUCTS

### 2.1 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.
- B. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.

### 2.2 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.
  - 1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
    - a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
- B. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.
  - 1. Finish: Plain.
- C. Stainless Steel Tie Wire: ASTM A1022/A1022M, not less than 0.0508 inch in diameter.

### 2.3 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protection of In-Place Conditions:
  - 1. Do not cut or puncture vapor retarder.
  - 2. Repair damage and reseal vapor retarder before placing concrete.

- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

### 3.2 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
  - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
  - 2. Do not tack weld crossing reinforcing bars.
- C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
- D. Provide concrete coverage in accordance with ACI 318.
- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Splices: Lap splices as indicated on Drawings.
  - 1. Bars indicated to be continuous, and all vertical bars to be lapped as indicated on the Drawings.
  - 2. Stagger splices in accordance with ACI 318.
- G. Install welded-wire reinforcement in longest practicable lengths.
  - 1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
    - a. For reinforcement less than W4.0 or D4.0, continuous support spacing to not exceed 12 inches.
  - 2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
  - 3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
  - 4. Lace overlaps with wire.

### 3.3 JOINTS

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
  - 1. Place joints perpendicular to main reinforcement.
  - 2. Continue reinforcement across construction joints unless otherwise indicated.
  - 3. Do not continue reinforcement through sides of strip placements of floors and slabs.

3.4 INSTALLATION TOLERANCES

- A. Comply with ACI 117.

3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field inspections and prepare inspection reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
  - 1. Steel-reinforcement placement.

END OF SECTION 032000

## SECTION 033000 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Concrete standards.
2. Concrete materials.
3. Admixtures.
4. Vapor retarders.
5. Curing materials.
6. Accessories.
7. Repair materials.
8. Concrete mixture materials.
9. Concrete mixture class types.
10. Concrete mixing.

##### B. Related Requirements:

1. Section 031000 "Concrete Forming and Accessories" for form-facing materials, form liners, insulating concrete forms, and waterstops.
2. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
3. Section 312000 "Earth Moving" for drainage fill under slabs-on-ground.
4. Section 321313 "Concrete Paving" for concrete pavement and walks.

#### 1.2 ACTION SUBMITTALS

##### A. Product data.

##### B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Compressive strength at 28 days or other age as specified.
3. Compressive strength required at stages of construction.
4. Durability exposure classes for Exposure Categories F, S, W, and C.
5. Maximum w/cm ratio.
6. Slump or slump flow limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Intended placement method.
10. Submit adjustments to design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant changes.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1.3 INFORMATIONAL SUBMITTALS

- A. Testing Agency: Include documentation indicating compliance with ASTM E329 or ASTM C1077 and copies of applicable ACI certificates for testing technicians or ACI Concrete Construction Special Inspector - MH, ASCC.
- B. Material certificates.
- C. Material test reports.
- D. Research reports.
- E. Preconstruction test reports.
- F. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified Installer who employs Project personnel qualified as an ACI-certified Concrete Flatwork Associate and Concrete Flatwork Finisher and a supervisor who is a certified ACI Advanced Concrete Flatwork Finisher/Technician or an ACI Concrete Flatwork Finisher with experience installing and finishing concrete.
  1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.
- B. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing that performs duties on behalf of the Architect/Engineer.
- C. Field Quality-Control Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1.5 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.
  1. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 CONCRETE STANDARDS

- A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

### 2.2 CONCRETE MATERIALS

#### A. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I/II, gray.
2. Fly Ash: ASTM C618, Class F.

#### B. Normal-Weight Aggregates:

1. Coarse Aggregate: ASTM C33/C33M, Class 1N
2. Maximum Coarse-Aggregate Size: 3/4-inch nominal.
3. Fine Aggregate: ASTM C33/C33M.

### 2.3 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C260/C260M.

- B. Chemical Admixtures: Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
6. Admixtures with special properties, with documentation of claimed performance enhancement, ASTM C494/C494M, Type S.

- C. Mixing Water for Concrete Mixtures and Water Used to Make Ice: ASTM C1602/C1602M. Include documentation of compliance with limits for alkalis, sulfates, chlorides, or solids content of mixing water from Table 2 in ASTM C1602/C1602M.

### 2.4 VAPOR RETARDERS

- A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A, not less than 10 mils thick. Include manufacturer's recommended thickness and adhesive or pressure-sensitive tape.

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. Barrier-Bac; Inteplast Group.
- b. Poly-America, L.P.
- c. Reef Industries, Inc.
- d. Stego Industries, LLC.
- e. Tex-Trude.
- f. W. R. Meadows, Inc.

## 2.5 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.
  - 1. Color:
    - a. Ambient Temperature Below 50 deg F (10 deg C): Black.
    - b. Ambient Temperature between 50 and 85 deg F (10 and 29 deg C): Any color.
    - c. Ambient Temperature Above 85 deg F (29 deg C): White.
- D. Water: Potable water that does not cause staining of the surface.
- E. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.
  - 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. ChemMasters, Inc.
    - b. Dayton Superior Corporation.
    - c. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
    - d. Kaufman Products, Inc.
    - e. SpecChem, LLC.
    - f. W. R. Meadows, Inc.
- F. Clear, Waterborne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.
  - 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. ChemMasters, Inc.
    - b. Dayton Superior Corporation.
    - c. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
    - d. Kaufman Products, Inc.

- e. SpecChem, LLC.
- f. W. R. Meadows, Inc.

## 2.6 ACCESSORIES

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 in accordance with ASTM D2240.
- C. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- D. Floor Slab Protective Covering: 8 ft. wide cellulose fabric.

## 2.7 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

## 2.8 CONCRETE MIXTURE MATERIALS

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.
  - 1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland or hydraulic cement in concrete assigned to Exposure Class F3 as follows:
  - 1. Fly Ash: 25 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
  - 1. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

## 2.9 CONCRETE MIXTURE CLASS TYPES

- A. Class A: Normal-weight concrete used for footings.
  - 1. Exposure Class: ACI 318 Class F0, Class S0, Class W0, and Class C1.

2. Minimum Compressive Strength: 3000 psi at 28 days.
  3. Maximum w/cm Ratio: 0.50.
  4. Slump Limit: 4 inches, plus or minus 1 inch for concrete.
  5. Air Content:
    - a. Exposure Class F1: 5.0 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.
  6. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cementitious materials.
- B. Class B: Normal-weight concrete used for 4-inch-thick slabs-on-grade.
1. Exposure Class: ACI 318 Class F0, Class S0, Class W0, and Class C1.
  2. Minimum Compressive Strength: 3000 psi at 28 days.
  3. Maximum w/cm Ratio: 0.50.
  4. Slump Limit: 4 inches, plus or minus 1 inch for concrete.
  5. Air Content:
    - a. Exposure Class F1: 5.0 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.
    - b. Total air content must not exceed 3 percent for concrete used in trowel-finished floors.
  6. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- C. Class C: Normal-weight concrete used for 5-inch-thick and 6-inch-thick slabs-on-grade and grade beams.
1. Exposure Class: ACI 318 Class F0, Class S0, Class W0, and Class C1.
  2. Minimum Compressive Strength: 4000 psi at 28 days.
  3. Maximum w/cm Ratio: 0.45.
  4. Slump Limit: 4 inches, plus or minus 1 inch for concrete.
  5. Air Content:
    - a. Exposure Class F1: 5.0 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.
    - b. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.
  6. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- D. Class D: Normal-weight concrete used for cast-in-place stairs, beams, and columns.
1. Exposure Class: ACI 318 Class F0, Class S0, Class W0, and Class C1.
  2. Minimum Compressive Strength: 4000 psi at 28 days.
  3. Maximum w/cm Ratio: 0.45.
  4. Slump Limit: 4 inches, plus or minus 1 inch for concrete.
  5. Air Content:
    - a. Exposure Class F1: 5.0 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.
  6. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

- E. Class E: Normal-weight concrete used for freestanding sign wall.
  - 1. Exposure Class: ACI 318 Class F0, Class S0, Class W0, and Class C1.
  - 2. Minimum Compressive Strength: 5000 psi at 28 days.
  - 3. Maximum w/cm Ratio: 0.45.
  - 4. Slump Limit: 4 inches, plus or minus 1 inch for concrete.
  - 5. Air Content:
    - a. Exposure Class F1: 5.0 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.
  - 6. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

## 2.10 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and furnish delivery ticket.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Before placing concrete, verify that installation of concrete forms, accessories, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not proceed until unsatisfactory conditions have been corrected.

### 3.2 TOLERANCES

- A. Comply with ACI 117.

### 3.3 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

### 3.4 INSTALLATION OF VAPOR RETARDERS

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

### 3.5 INSTALLATION OF CAST-IN-PLACE CONCRETE

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Water addition in transit or at the Project site must be in accordance with ASTM C94/C94M and must not exceed the permitted amount indicated on the concrete delivery ticket.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

### 3.6 INSTALLATION OF JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
  - 1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
  - 2. Place joints perpendicular to main reinforcement.
    - a. Continue reinforcement across construction joints unless otherwise indicated.
  - 3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
  - 4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  - 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  - 6. Space vertical joints in walls as indicated on Drawings. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
  - 7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
  - 1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  - 2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
- D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints:

1. Install dowel bars and support assemblies at joints where indicated on Drawings.
2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

### 3.7 APPLICATION OF FINISHING FLOORS AND SLABS

A. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

B. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface. Use of an approved finishing aid is acceptable.
5. Do not apply troweled finish to concrete, which has a total air content greater than 3 percent.
6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.

C. Trowel and Fine-Broom Finish: First apply a trowel finish to surfaces indicated on Drawings and where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.

1. Coordinate required final finish with Architect before application.
2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

- D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.
  - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with a fiber-bristle broom perpendicular to main traffic route.
  - 2. Coordinate required final finish with Architect before application.
- E. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate or aluminum granule finish per architect to concrete stair treads, platforms, and ramps, as indicated on Drawings.
  - 1. Apply in accordance with manufacturer's written instructions and as follows:
    - a. Uniformly spread 25 lb/100 sq. ft. of dampened slip-resistive aggregate or aluminum granules over surface in one or two applications.
    - b. Tamp aggregate flush with surface, but do not force below surface.
    - c. After broadcasting and tamping, apply float finish.
    - d. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate or aluminum granules.

### 3.8 APPLICATION OF FINISHING FORMED SURFACES

- A. As-Cast Surface Finishes:
  - 1. ACI 301 (ACI 301M) Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.
    - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
    - b. Remove projections larger than 1/4 inch.
    - c. Patch tie holes.
    - d. Surface Tolerance: ACI 117, Class B.
    - e. Locations: Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- B. Rubbed Finish: Apply the following to as-cast surface finishes where indicated on Drawings:
  - 1. Smooth-Rubbed Finish:
    - a. Perform no later than one day after form removal.
    - b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
    - c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.
    - d. Maintain required patterns or variances as shown on Drawings or to match design reference sample.

### 3.9 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

#### A. Filling in:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to match color and texture with in-place construction exposed to view.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

#### B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

#### C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 4 inches high unless otherwise indicated on Drawings and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
3. Minimum Compressive Strength: 5000 psi at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
6. Prior to pouring concrete, place and secure anchorage devices.
  - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - b. Cast anchor-bolt insert into bases.
  - c. Install anchor bolts to elevations required for proper attachment to supported equipment.

### 3.10 APPLICATION OF CONCRETE CURING

#### A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305R, before and during finishing operations.

#### B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
3. If forms remain during curing period, moist cure after loosening forms.

4. If removing forms before end of curing period, continue curing for remainder of curing period as follows:
  - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
  - b. Continuous Sprinkling: Maintain concrete surface continuously wet.
  - c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
  - d. Water-Retention Sheetting Materials: Cover exposed concrete surfaces with sheetting material, taping, or lapping seams.
  - e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
    - 1) Recoat areas subject to heavy rainfall within three hours after initial application.
    - 2) Maintain continuity of coating and repair damage during curing period.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing after finishing concrete.
2. Interior Concrete Floors:
  - a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
    - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
      - a) Lap edges and ends of absorptive cover not less than 12 inches.
      - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
    - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
      - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
      - b) Cure for not less than seven days.
    - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following not in cold weather:
      - a) Water.
      - b) Continuous water-fog spray.
  - b. Floors to Receive Polished Finish: Contractor has option of the following:

- 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
    - a) Lap edges and ends of absorptive cover not less than 12 inches.
    - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
  - 2) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
    - a) Water.
    - b) Continuous water-fog spray.
- c. Floors To Receive Urethane Flooring:
- 1) As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
  - 2) Rewet absorptive cover, and cover immediately with polyethylene moisture-retaining cover with edges lapped 6 inches and sealed in place.
  - 3) Secure polyethylene moisture-retaining cover in place to prohibit air from circulating under polyethylene moisture-retaining cover.
  - 4) Leave absorptive cover and polyethylene moisture-retaining cover in place for duration of curing period, but not less than 28 days.
- d. Floors To Receive Curing Compound:
- 1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
  - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
  - 3) Maintain continuity of coating, and repair damage during curing period.
  - 4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.
- e. Floors To Receive Curing and Sealing Compound:
- 1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
  - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
  - 3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

### 3.11 INSTALLATION OF JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.

### 3.12 INSTALLATION OF CONCRETE SURFACE REPAIRS

#### A. Defective Concrete:

1. Repair and patch defective areas when approved by Architect.
2. Remove and replace concrete that cannot be repaired and patched to meet specification requirements.

#### B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

#### C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks in excess of 0.01 inch spalls, air bubbles exceeding surface finish limits, honeycombs, rock pockets, fins and other projections on the surface exceeding surface finish limits, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.
  - a. Limit cut depth to 3/4 inch.
  - b. Make edges of cuts perpendicular to concrete surface.
  - c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
  - d. Fill and compact with patching mortar before bonding agent has dried.
  - e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
  - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
  - b. Compact mortar in place and match surrounding surface.
3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance, as determined by Architect.

#### D. Repairing Unformed Surfaces:

1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
  - a. Correct low and high areas.
  - b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width.
3. After concrete has cured at least 14 days, correct high areas by grinding.

4. Correct localized low areas during, or immediately after, completing surface-finishing operations by adding patching mortar.
  - a. Finish repaired areas to blend into adjacent concrete.
5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
  - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
  - b. Feather edges to match adjacent floor elevations.
6. Correct other low areas scheduled to remain exposed with repair topping.
  - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
  - b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
  - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
  - b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
  - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
  - d. Place, compact, and finish to blend with adjacent finished concrete.
  - e. Cure in same manner as adjacent concrete.
8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.
  - a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
  - b. Dampen cleaned concrete surfaces and apply bonding agent.
  - c. Place patching mortar before bonding agent has dried.
  - d. Compact patching mortar and finish to match adjacent concrete.
  - e. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

### 3.13 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field inspections and prepare inspection reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
  - 1. Testing agency to be responsible for providing curing facility for initial curing of strength test specimens on-site and verifying that test specimens are cured in accordance with standard curing requirements in ASTM C31/C31M.
  - 2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
  - 3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
- C. Delivery Tickets: Comply with ASTM C94/C94M.
- D. Inspections:
  - 1. Headed bolts and studs.
  - 2. Verification of use of required design mixture.
  - 3. Concrete placement, including conveying and depositing.
  - 4. Curing procedures and maintenance of curing temperature.
  - 5. Verification of concrete strength before removal of shores and forms from beams and slabs.
  - 6. Batch Plant Inspections: On a random basis, as determined by Architect.
- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:
  - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
    - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing is to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  - 2. Slump: ASTM C143/C143M:
    - a. One test at point of delivery for each composite sample, but not less than one test for each day's pour of each concrete mixture.
    - b. Perform additional tests as needed.
  - 3. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete.
    - a. One test for each composite sample when strength test specimens are cast, but not less than one test for each day's pour of each concrete mixture.
  - 4. Concrete Temperature: ASTM C1064/C1064M:

- a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample when strength test specimens are cast.
5. Concrete Density: ASTM C138/C138M:
    - a. One test for each composite sample when strength test specimens are cast.
  6. Compression Test Specimens: ASTM C31/C31M:
    - a. Cast and standard cure two sets of four 6 inches by 12-inches or 4-inch by 8-inch cylindrical specimens for each composite sample.
    - b. Cast and field cure two sets of four standard cylindrical specimens for each composite sample.
  7. Compressive-Strength Tests: ASTM C39/C39M.
    - a. Test one set of four standard cured specimens at seven days and one set of four specimens at 28 days.
    - b. Test one set of four field-cured specimens at seven days and one set of four specimens at 28 days.
    - c. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
  8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
  9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests of standard cured cylinders equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
  10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
  11. Additional Tests:
    - a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
    - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
      - 1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.7.6.3.
  12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
  13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

3.14 PROTECTION

- A. Protect concrete surfaces.
- B. Protect from petroleum stains.
- C. Prohibit vehicles from interior concrete slabs.
- D. Prohibit placement of steel items on concrete surfaces.

END OF SECTION 033000

## SECTION 042200 - CONCRETE UNIT MASONRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Concrete masonry units.
2. Mortar and grout materials.
3. Reinforcement.
4. Masonry-joint reinforcement.
5. Embedded flashing materials.
6. Miscellaneous masonry accessories.

##### B. Products Installed, but Not Furnished, under This Section:

1. Precast architectural concrete trim in accordance with Section 034500 "Precast Architectural Concrete" in concrete unit masonry.
2. Brick veneer and CMU veneer in accordance with Section 042613 "Masonry Veneer" in concrete unit masonry.
3. Cast-stone trim in accordance with Section 047200 "Cast Stone Masonry" in concrete unit masonry.
4. Steel lintels and steel shelf angles in accordance with Section 051200 "Structural Steel Framing" in concrete unit masonry.

#### 1.2 ACTION SUBMITTALS

##### A. Product data.

##### B. Shop Drawings: For the following: Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.

##### C. Samples for Verification: For each type and color of the following:

1. Exposed CMUs.

#### 1.3 INFORMATIONAL SUBMITTALS

##### A. Qualification Data: For testing agency.

##### B. Material certificates.

##### C. Mix designs.

##### D. Statement of compressive strength of masonry.

## 1.4 QUALITY ASSURANCE

- A. Project team craftworkers of the Masonry Contractor assigned to Project will be required to have the International Masonry Institute - Flashing Training or equal and to provide evidence of certificate or a letter of the firm's commitment to enroll key project personnel in the training program prior to the start of Project.
- B. Project team craftworkers of the Masonry Contractor assigned to Project will be required to have the International Masonry Institute - Grouting and Reinforcing Training or equal and to provide evidence of certificate or a letter of the firm's commitment to enroll key project personnel in the training program prior to the start of Project.
- C. Testing Agency Qualifications: Qualified in accordance with ASTM C1093 for testing indicated.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.
  - 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) in accordance with Tables 1 and 2 in TMS 402/602.
- B. Regulatory Requirements: Comply with the provisions of the following codes, specifications, and standards, except as otherwise shown or specified:
  - 1. TMS 402/602.

### 2.2 CONCRETE UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 402/602 except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 ft. vertically and horizontally of a walking surface.
- C. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
  - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
  - 2. Provide square-edged units for outside corners unless otherwise indicated.
- D. Concrete Building Brick: ASTM C55.

E. Building Lintels:

1. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout.
  - a. Knockout blocks will not be acceptable.
2. Concrete Lintels: Precast and Formed in Place Complying with requirements in Section 033000 "Cast-in-Place Concrete," and with reinforcing bars indicated.

2.3 CONCRETE MASONRY UNITS

A. Standard CMUs: Load-bearing ASTM C90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
2. Density Classification: Normal weight.
3. Size (Width): Manufactured to dimensions 3/8 inch less-than-nominal dimensions.
4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

B. Architectural CMUs: Load bearing, ASTM C90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
2. Density Classification: Normal weight.
3. Size (Width): Manufactured to dimensions 3/8 inch less-than-nominal dimensions.
4. Pattern and Texture:
  - a. Scored vertically so units laid in running bond appear as square units laid in stacked bond, standard finish.

2.4 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

1. Alkali content is not more than 0.1 percent when tested in accordance with ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Aggregate for Mortar: ASTM C144.

1. White-Mortar Aggregates: Natural white sand or crushed white stone.
2. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

D. Aggregate for Grout: ASTM C404.

- E. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
  - 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. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
    - b. GCP Applied Technologies Inc.
- F. Water: Potable.

## 2.5 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
  - 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. Heckmann Building Products, Inc.
    - b. Hohmann & Barnard, Inc.
    - c. Wire-Bond.
- C. Masonry-Joint Reinforcement, General: Ladder type complying with ASTM A951/A951M.
  - 1. Interior Walls: Hot-dip galvanized carbon steel.
  - 2. Exterior Walls: Hot-dip galvanized carbon steel.
  - 3. Wire Size for Side Rods: 0.187-inch diameter.
  - 4. Wire Size for Cross Rods: 0.187-inch diameter.
  - 5. Spacing of Cross Rods: Not more than 16 inches o.c.
  - 6. Provide in lengths of not less than 10 ft., with prefabricated corner and tee units.

## 2.6 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
  - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A153/A153M, Class B-2 coating.
  - 2. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M commercial steel, with ASTM A153/A153M, Class B coating.
  - 3. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

- B. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
  - 1. Tie Section: Triangular-shaped wire tie made from 0.25-inch- diameter, hot-dip galvanized steel wire.
- C. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
  - 1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.105-inch-thick steel sheet, galvanized after fabrication.
  - 2. Tie Section: Triangular-shaped wire tie made from 0.25-inch- diameter, hot-dip galvanized steel wire.
- D. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins unless otherwise indicated.
  - 1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A153/A153M.

## 2.7 EMBEDDED FLASHING MATERIALS

- A. Flexible Flashing:
  - 1. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.030 inch.
    - a. 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) GCP Applied Technologies Inc.
      - 2) Heckmann Building Products, Inc.
      - 3) Hohmann & Barnard, Inc.
      - 4) W. R. Meadows, Inc.
      - 5) Wire-Bond.
    - b. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturers.
- B. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

## 2.8 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane, or PVC.

- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).
- D. Masonry Cleaners:
  - 1. Proprietary Acidic Masonry Cleaner: Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use by manufacturer of masonry units being cleaned.
    - a. 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) Diedrich Technologies, Inc.; a Hohmann & Barnard company.
      - 2) EaCo Chem, Inc.
      - 3) PROSOCO, Inc.

## 2.9 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
  - 2. Use portland cement-lime mortar unless otherwise indicated.
  - 3. For exterior masonry, use portland cement-lime mortar.
  - 4. For reinforced masonry, use portland cement-lime mortar.
- B. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
  - 1. For masonry below grade or in contact with earth, use Type M.
  - 2. For reinforced masonry, use Type S.
  - 3. For mortar parge coats, use Type S.
  - 4. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type S.
- C. Grout for Unit Masonry: Comply with ASTM C476.
  - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 402/602 for dimensions of grout spaces and pour height.

2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2500 psi.
3. Provide grout with a slump of 8 to 11 inches as measured in accordance with ASTM C143/C143M.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- B. Exposed Masonry: Mix units to produce uniform blend of colors and textures.
- C. Temperature Control: Perform temperature-sensitive construction procedures while masonry Work is progressing. Temperature ranges vary at time of installation, except for grout. For grout, temperature ranges apply to anticipated minimum night temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10 deg F.
- D. Masonry Protection: Protect completed masonry and masonry not being worked by the required day and night anticipated minimum air temperatures.

### 3.2 TOLERANCES

- A. Dimensions and Locations of Elements:
  1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
  2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
  3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.
- B. Lines and Levels:
  1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 ft., or 1/2 inch maximum.
  2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 ft., 1/4 inch in 20 ft., or 1/2 inch maximum.
  3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 ft., 3/8 inch in 20 ft., or 1/2 inch maximum.
  4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 ft., 1/4 inch in 20 ft., or 1/2 inch maximum.
  5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 ft., 3/8 inch in 20 ft., or 1/2 inch maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 8-inch horizontal face dimensions at corners or jambs.
- C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- D. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- E. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- F. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
  1. Bed face shells in mortar and make head joints of depth equal to bed joints.
  2. Bed webs in mortar in all courses of piers, columns, and pilasters.
  3. Bed webs in mortar in grouted masonry, including starting course on footings.
  4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
- B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

### 3.5 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
  - 1. Space reinforcement not more than 16 inches o.c.
  - 2. Space reinforcement not more than 8 inches o.c. in foundation walls and in lintels.
  - 3. Provide reinforcement not more than 8 inches above and below wall openings and extending 24 inches beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units and rigid anchors.
- D. Provide continuity at corners by using prefabricated L-shaped units.

### 3.6 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
  - 1. Provide an open space not less than 1/2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
  - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
  - 3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

### 3.7 CONTROL JOINTS

- A. General: Install control joint materials in CMUs as masonry progresses. Do not allow materials to span control joints without provision to allow for in-plane wall or partition movement.
- B. Locate control joints. See Drawings and Comply with NCMA TEK 10-02D.

### 3.8 LINTELS

- A. Install lintels over openings as indicated.
- B. Provide concrete or formed-in-place masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

- C. Install loose steel over openings. See Drawings.
  - 1. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.
- D. Lintels at Fire-Rated Openings: Provide fire-rated masonry required or steel lintels with applied fireproofing in thickness required to maintain fire rating of wall or partition rating.

### 3.9 FLASHING

- A. General: Install embedded flashing at ledges and other obstructions to downward flow of water in wall where indicated.
- B. Install flashing as follows unless otherwise indicated:
  - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
  - 2. At lintels, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
  - 3. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal drip edge.

### 3.10 REINFORCED UNIT MASONRY

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
  - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 402/602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
  - 1. Comply with requirements in TMS 402/602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
  - 2. Limit height of vertical grout pours to not more than 60 inches.

### 3.11 FIELD QUALITY CONTROL

- A. Inspecting: Owner will engage a special inspector to perform inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform inspections. Remedial work required to comply with the contract documents (drawings and specifications) is completed at the Contractor's expense.
- B. Testing: Engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements is done at Contractor's expense.
- C. Inspections: Level C special inspections to comply with the Florida Building Code.
  - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
  - 2. Place grout only after inspectors have verified compliance of grout spaces, grades, sizes, and locations of reinforcement.
  - 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- D. Testing Prior to Construction: One set of tests.
- E. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.
- F. Concrete Masonry Unit Test: For each type of unit provided, in accordance with ASTM C140 for compressive strength.
- G. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, in accordance with ASTM C780.
- H. Grout Test (Compressive Strength): For each mix provided, in accordance with ASTM C1019.

### 3.12 PARGING

- A. Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of 3/4 inch. Dampen wall before applying first coat and scarify first coat to ensure full bond to subsequent coat.
- B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot. Form a wash at top of parging and a cove at bottom.
- C. Damp-cure parging for at least 24 hours and protect parging until cured.

### 3.13 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as Work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.

#### 3.14 MASONRY WASTE DISPOSAL

- A. Masonry Waste Recycling: Return broken CMUs not used to manufacturer for recycling.
- B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used, or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042200

## SECTION 051200 - STRUCTURAL STEEL FRAMING

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Structural steel.
2. Shear stud connectors, shop welded.
3. Shrinkage-resistant grout.

#### 1.2 DEFINITIONS

- ##### A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

#### 1.3 ACTION SUBMITTALS

##### A. Product Data:

1. Structural-steel materials.
2. High-strength, bolt-nut-washer assemblies.
3. Shear stud connectors.
4. Anchor rods.
5. Threaded rods.
6. Shop primer.
7. Galvanized-steel primer.
8. Etching cleaner.
9. Galvanized repair paint.
10. Shrinkage-resistant grout.

- ##### B. Shop Drawings: Show fabrication of structural-steel components.

#### 1.4 INFORMATIONAL SUBMITTALS

- ##### A. Welding certificates.
- ##### B. Mill test reports for structural-steel materials, including chemical and physical properties.
- ##### C. Source quality-control reports.
- ##### D. Field quality-control reports.

## 1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).
- B. Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
- C. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Comply with applicable provisions of the following specifications and documents:
  - 1. ANSI/AISC 303.
  - 2. ANSI/AISC 360.
  - 3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- B. Connection Design Information:
  - 1. Option 1: Connection designs have been completed and connections indicated on the Drawings.
- C. Moment Connections: Type FR, fully restrained.
- D. Construction: Shear wall system.

### 2.2 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A992/A992M.
- B. Channels, Angles: ASTM A36/A36M.
- C. Plate and Bar: ASTM A36/A36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade B structural tubing.
- E. Steel Pipe: ASTM A53/A53M, Type E or Type S, Grade B.
- F. Welding Electrodes: Comply with AWS requirements.

## 2.3 BOLTS AND CONNECTORS

- A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
  - 1. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with plain finish.
- B. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
  - 1. Finish: Hot-dip or mechanically deposited zinc coating.
  - 2. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with mechanically deposited zinc coating finish.
- C. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

## 2.4 RODS

- A. Headed Anchor Rods: ASTM F1554, Grade 36, straight.
  - 1. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C.
- B. Threaded Rods: ASTM A36/A36M.
  - 1. Finish: Plain.

## 2.5 PRIMER

- A. Steel Primer:
  - 1. Comply with Section 099113 "Exterior Painting" and Section 099600 "High-Performance Coatings."
  - 2. SSPC-Paint 23, latex primer, for exposed exterior painted steel, if not covered in the specification sections listed above.
  - 3. Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat for unexposed interior steel.
- B. Galvanized-Steel Primer: MPI#134.
  - 1. Etching Cleaner: MPI#25, for galvanized steel.
  - 2. Galvanizing Repair Paint: ASTM A780/A780M.

## 2.6 SHRINKAGE-RESISTANT GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## 2.7 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.
- B. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using automatic end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.

## 2.8 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

## 2.9 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.
  - 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.

## 2.10 SHOP PRIMING

- A. Shop prime steel surfaces, except the following:
  - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
  - 2. Surfaces to be field welded.
  - 3. Surfaces of high-strength bolted, slip-critical connections.
  - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
  - 5. Galvanized surfaces unless indicated to be painted.
  - 6. Surfaces enclosed in interior construction.
- B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:

1. SSPC-SP 3.
  2. SSPC-SP 6 (WAB)/NACE WAB-3 before using the SSPC-Paint 23, latex primer.
- C. Surface Preparation of Galvanized Steel: Prepare galvanized-steel surfaces for shop priming by thoroughly cleaning steel of grease, dirt, oil, flux, and other foreign matter, and treating with etching cleaner.
- D. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 2.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
1. Set plates for structural members on wedges, shims, or setting nuts as required.
  2. Weld plate washers to top of baseplate if indicated on the plans.
  3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.
- C. Maintain erection tolerances of structural steel within ANSI/AISC 303.

### 3.3 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
1. Joint Type: Snug tightened.

- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

### 3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform the following special inspections:
  - 1. Verify structural-steel materials and inspect steel frame joint details.
  - 2. Verify weld materials and inspect welds.
  - 3. Verify connection materials and inspect high-strength bolted connections.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
  - 1. Bolted Connections: Inspect and test bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
  - 2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.
    - a. In addition to visual inspection, test and inspect field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
      - 1) Liquid Penetrant Inspection: ASTM E165/E165M.
      - 2) Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
      - 3) Ultrasonic Inspection: ASTM E164.
      - 4) Radiographic Inspection: ASTM E94/E94M.

END OF SECTION 051200

## SECTION 053100 - STEEL DECKING

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Roof and wall deck.

#### 1.2 ACTION SUBMITTALS

##### A. Product Data:

1. Roof and wall deck.

##### B. Shop Drawings:

1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

#### 1.3 INFORMATIONAL SUBMITTALS

##### A. Certificates:

1. Welding certificates.
2. Product Certificates: For each type of steel deck.

##### B. Test and Evaluation Reports:

1. Product Test Reports: For tests performed by a qualified testing agency, indicating that power-actuated mechanical fasteners comply with requirements.
2. Research Reports: For steel deck, from ICC-ES showing compliance with the building code.

##### C. Field Quality-Control Submittals:

1. Field quality-control reports.

##### D. Qualification Statements: For welding personnel and testing agency.

#### 1.4 QUALITY ASSURANCE

##### A. Qualifications:

1. Welding Qualifications: Qualify procedures and personnel in accordance with SDI QA/QC and the following welding code:

a. AWS D1.3/D1.3M.

B. FM Approvals' RoofNav Listing: Provide steel roof deck evaluated by FM Approvals and listed in its "RoofNav" for Class 1 fire rating and Class 1-90 windstorm ratings. Identify materials with FM Approvals Certification markings.

## 1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in accordance with SDI MOC3. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

A. AISI Specifications: Comply with calculated structural characteristics of steel deck in accordance with AISI S100.

### 2.2 ROOF AND WALL DECK

A. 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. Epic Metals Corporation.
2. New Millennium Building Systems, LLC.
3. Vulcraft Group; Division of Nucor Corp.
4. Vulcraft/Verco Group; a division of Nucor Corp.

B. Roof and Wall Deck: Fabricate panels, without top-flange stiffening grooves, to comply with SDI RD and with the following:

1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 50, G90 zinc coating.
2. Deck Profile: Type WR, wide rib.
3. Profile Depth: 1-1/2 inches.
4. Design Uncoated-Steel Thickness: 0.0358 inch at roof deck installed on roofs and 0.0598 inch at roof deck installed on walls.
5. Span Condition: Triple span or more.
6. Side Laps: Overlapped or interlocking seam at Contractor's option.

## 2.3 ACCESSORIES

- A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 12 minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 50,000 psi, not less than 0.0359-inch and 0.0598-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- G. Galvanizing Repair Paint: SSPC-Paint 20 or MIL-P-21035B, with dry film containing a minimum of 94 percent zinc dust by weight.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Install deck panels and accessories in accordance with SDI C, SDI NC, and SDI RD, as applicable; manufacturer's written instructions; and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

- I. Mechanical fasteners may be used in lieu of welding to fasten deck where indicated on the plans. Locate mechanical fasteners and install in accordance with deck manufacturer's written instructions.

### 3.2 INSTALLATION OF ROOF AND WALL DECK

- A. Fasten roof-deck panels to steel supporting members by mechanical fasteners as follows:
  - 1. Screw Size: No. 12 diameter or larger, carbon-steel screws.
  - 2. Screw Spacing: As indicated on plans.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports as indicated on the plans and as follows:
  - 1. Mechanically fasten with self-drilling, No. 12 diameter or larger, carbon-steel screws.
  - 2. Screw Spacing: As indicated on plans.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/4 inches, with end joints as follows:
  - 1. End Joints: Lapped 2 inches minimum.
- D. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels in accordance with deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
  - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

### 3.3 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

### 3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field inspections and prepare inspection reports.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections and to submit reports.
- C. Tests and Inspections:

1. Special inspections and qualification of welding special inspectors for cold-formed steel floor and roof deck in accordance with quality-assurance inspection requirements of SDI QA/QC.
    - a. Field welds will be subject to inspection.
  2. Steel decking will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 053100

## SECTION 054000 - COLD-FORMED METAL FRAMING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Exterior non-load-bearing wall framing.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Cold-formed steel framing materials.
  - 2. Exterior non-load-bearing wall framing.
  - 3. Vertical deflection clips.
  - 4. Single deflection track.
  - 5. Double deflection track.
  - 6. Drift clips.
  - 7. Post-installed anchors.
  - 8. Power-actuated anchors.
- B. Shop Drawings:
  - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
  - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
- C. Delegated Design Submittal: For cold-formed steel framing.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product certificates.
- C. Product test reports.
- D. Research Reports:
  - 1. For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

## 1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency.
- C. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association, the Steel Framing Industry Association, the Steel Stud Manufacturers Association, or the Supreme Steel Framing System Association.
- D. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. 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. ClarkDietrich.
  - 2. Marino\WARE.
  - 3. SCAFCO Steel Stud Company; Stone Group of Companies.
  - 4. Steel Construction Systems; Stone Group of Companies.
  - 5. Steel Network, Inc. (The).

### 2.2 PERFORMANCE REQUIREMENTS

- A. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing complies with AISI S100 and AISI S240.
- B. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

### 2.3 COLD-FORMED STEEL FRAMING MATERIALS

- A. Framing Members, General: Comply with AISI S240 for conditions indicated.
- B. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
  - 1. Grade: As required by structural performance.
  - 2. Coating: G90 or equivalent.
- C. Steel Sheet for Vertical Deflection and Drift Clips: ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:

1. Grade: As required by structural performance.
2. Coating: G90.

#### 2.4 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
  1. Minimum Base-Metal Thickness: 0.0428 inch.
  2. Flange Width: 1-5/8 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.
- C. Vertical Deflection Clips, Exterior: Manufacturer's standard bypass and head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
  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. ClarkDietrich.
    - b. Marino\WARE.
    - c. SCAFCO Steel Stud Company; Stone Group of Companies.
    - d. Simpson Strong-Tie Co., Inc.
    - e. Steel Construction Systems; Stone Group of Companies.
    - f. Steel Network, Inc. (The).
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
- F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

#### 2.5 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated.

## 2.6 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123/A123M.
- B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A153/A153M, Class C.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193, ICC-ES AC58, or ICC-ES AC308 as appropriate for the substrate.
  - 1. Uses: Securing cold-formed steel framing to structure.
  - 2. Type: adhesive anchor.
  - 3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
- D. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
  - 1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

## 2.7 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A780/A780M, MIL-P-21035B, or SSPC-Paint 20.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
- D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

- E. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- G. Install insulation, specified in Section 072100 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- H. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

### 3.2 INSTALLATION OF EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
  - 1. Stud Spacing: 16 inches on-center minimum or as required by structural performance.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
  - 1. Install single deep-leg deflection tracks and anchor to building structure.
  - 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
  - 3. Connect vertical deflection clips to bypassing and infill studs and anchor to building structure.
  - 4. Connect drift clips to cold-formed steel framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
  - 1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
- F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
  - 1. Install solid blocking at centers indicated on Shop Drawings.

- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

### 3.3 INSTALLATION TOLERANCES

- A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
  - 1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

### 3.4 REPAIRS

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

### 3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field inspections and prepare inspection reports.
- B. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- C. Field and shop welds will be subject to testing and inspecting.
- D. Testing agency will report test results promptly and in writing to Contractor and Architect.
- E. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION 054000

## SECTION 054400 - COLD-FORMED METAL TRUSSES

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Cold-formed steel roof trusses.

#### 1.2 ACTION SUBMITTALS

##### A. Product Data: For the following:

1. Cold-formed steel truss materials.
2. Anchor bolts.
3. Post-installed anchors.
4. Power-actuated fasteners.
5. Mechanical fasteners.

##### B. Shop Drawings:

1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel trusses; fabrication; and fastening and anchorage details, including mechanical fasteners.
2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

##### C. Delegated Design Submittals: For cold-formed steel trusses.

#### 1.3 INFORMATIONAL SUBMITTALS

##### A. Welding certificates.

##### B. Product test reports.

##### C. Research Reports: For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

##### D. Field quality-control reports.

#### 1.4 QUALITY ASSURANCE

##### A. Testing Agency Qualifications: Qualified in accordance with ASTM E329 for testing indicated.

##### B. Product Tests: Mill certificates or data from a qualified independent testing agency.

- C. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cold-formed steel trusses.
- B. Structural Performance: Provide cold-formed steel trusses capable of withstanding design loads within limits and under conditions indicated.
  - 1. Design Loads: As indicated on Drawings.
  - 2. Deflection Limits: Design trusses to withstand design loads without deflections greater than the following:
    - a. Roof Trusses: Vertical deflection of 1/360 of the span.
  - 3. Design trusses to provide for movement of truss members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
- C. Cold-Formed Steel Truss Standards: Unless more stringent requirements are indicated, trusses comply with the following:
  - 1. Floor and Roof Systems: AISI S210.
  - 2. Lateral Design: AISI S213.
  - 3. Roof Trusses: AISI S214.
- D. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

### 2.2 COLD-FORMED STEEL TRUSS MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
  - 1. Grade: ST33H minimum and as required by structural performance.
  - 2. Coating: G90.

### 2.3 COLD-FORMED STEEL ROOF TRUSSES

- A. Roof Truss Members: Manufacturer's standard C-shaped steel sections.

1. Connecting Flange Width: 1-5/8 inches, minimum at top and bottom chords connecting to sheathing or other directly fastened construction.
2. Minimum Base-Metal Thickness: 0.0428 inch.

## 2.4 TRUSS ACCESSORIES

- A. Fabricate steel-truss accessories from steel sheet, ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for truss members.
- B. Provide accessories of manufacturer's standard thickness and configuration unless otherwise indicated.

## 2.5 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process in accordance with ASTM A123/A123M.
- B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process in accordance with ASTM A153/A153M, Class C.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC193, ICC-ES AC58, or ICC-ES AC308 as appropriate for the substrate.
  1. Uses: Securing cold-formed steel trusses to structure.
  2. Type: Adhesive anchor.
  3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
- D. Power-Actuated Fasteners: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
  1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

## 2.6 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: MIL-P-21035B or SSPC-Paint 20.
- B. Shims: Load-bearing, high-density multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as truss members supported by shims.

## 2.7 FABRICATION OF COLD-FORMED STEEL TRUSSES AND ACCESSORIES

- A. Fabricate cold-formed steel trusses and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
  - 1. Fabricate trusses using jigs or templates.
  - 2. Cut truss members by sawing or shearing; do not torch cut.
  - 3. Fasten cold-formed steel truss members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator.
    - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
  - 4. Fasten other materials to cold-formed steel trusses by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace trusses to withstand handling, delivery, and erection stresses. Lift fabricated trusses by means that prevent damage or permanent distortion.
- C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet and as follows:
  - 1. Spacing: Space individual truss members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.
  - 2. Squareness: Fabricate each cold-formed steel truss to a maximum out-of-square tolerance of 1/8 inch.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed steel trusses without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.

### 3.2 INSTALLATION

- A. Install bridging, and brace cold-formed steel trusses according to AISI S200, AISI S202, AISI S214, and manufacturer's written instructions unless more stringent requirements are indicated.
  - 1. Anchor trusses securely at all bearing points.

2. Coordinate with wall framing to align webs of bottom chords and load-bearing studs or continuously reinforce track to transfer loads to structure.
  3. Install continuous bridging and permanently brace trusses as indicated on Shop Drawings and designed according to CFSEI's Technical Note 551e, "Design Guide: Permanent Bracing of Cold-Formed Steel Trusses."
- B. Install cold-formed steel trusses and accessories true to line and location, and with connections securely fastened.
1. Erect trusses with plane of truss webs plumb and parallel to each other. Align and accurately position trusses at required spacings.
  2. Erect trusses without damaging truss members or connections.
  3. Fasten cold-formed steel trusses by welding or mechanical fasteners.
    - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners, install according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.
- C. Install temporary bracing and supports to secure trusses and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to trusses are secured.
- D. Truss Spacing: 48 inches or as indicated on Shop Drawings.
- E. Do not alter, cut, or remove truss members or connections of trusses.

### 3.3 ERECTION TOLERANCES

- A. Install cold-formed steel trusses level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
1. Space individual trusses no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

### 3.4 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel trusses with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

### 3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
1. Special inspections as outlined in the threshold inspection plan.

- B. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- C. Field and shop welds will be subject to testing and inspecting.
- D. Testing agency will report test results promptly and in writing to Contractor and Architect.
- E. Cold-formed metal trusses will be considered defective if they do not pass tests and inspections.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- G. Prepare test and inspection reports.

### 3.6 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel trusses are without damage or deterioration at time of Substantial Completion.

END OF SECTION 054400

## SECTION 15005 - MECHANICAL GENERAL

### 1 GENERAL

1.1 The work covered by this division consists of providing all labor, equipment and materials and performing all operations necessary for the installation of the mechanical work as herein called for and shown on the drawings.

### 1.2 Related Documents:

1.2.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2.2 This is a Basic Mechanical Requirements Section. Provisions of this section apply to work of all Division 15 sections.

1.2.3 Review all other contract documents to be aware of conditions affecting work herein.

### 1.2.4 Definitions:

1.2.4.1 Provide: Furnish and install, complete and ready for intended use.

1.2.4.2 Furnish: Supply and deliver to project site, ready for subsequent requirements.

1.2.4.3 Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.

1.3 Permits and Fees: Contractor shall obtain all necessary permits, meters, and inspections required for his work and pay all fees and charges incidental thereto.

1.4 Verification of Owner's Data: Prior to commencing any work the Contractor shall satisfy himself as to the accuracy of all data as indicated in these plans and specifications and/or as provided by the Owner. Should the Contractor discover any inaccuracies, errors, or omissions in the data, he shall immediately notify the Architect/Engineer in order that proper adjustments can be anticipated and ordered. Commencement by the Contractor of any work shall be held as an acceptance of the data by him after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions or inaccuracies of the said data.

1.5 Delivery and Storage of Materials: Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. All material shall be stored to provide protection from the weather and accidental damage.

1.6 Extent of work is indicated by the drawings, schedules, and the requirements of the specifications. Singular references shall not be constructed as requiring only one device if multiple devices are shown on the drawings or are required for proper system operation.

### 1.7 Field Measurements and Coordination:

- 1.7.1 The intent of the drawings and specifications is to obtain a complete and satisfactory installation. Separate divisional drawings and specifications shall not relieve the Contractor or subcontractors from full compliance of work of his trade indicated on any of the drawings or in any section of the specifications.
- 1.7.2 Verify all field dimensions and locations of equipment to insure close, neat fit with other trades' work. Make use of all contract documents and approved shop drawings to verify exact dimension and locations.
- 1.7.3 Coordinate work in this division with all other trades in proper sequence to insure that the total work is completed within contract time schedule and with a minimum cutting and patching.
- 1.7.4 Locate all apparatus symmetrical with architectural elements. Install to exact height and locations when shown on architectural drawings. When locations are shown only on mechanical drawings, be guided by architectural details and conditions existing at job and correlate this work with that of others.
- 1.7.5 Install work as required to fit structure, avoid obstructions, and retain clearance, headroom, openings and passageways. Cut no structural members without written approval.
- 1.7.6 Carefully examine any existing conditions, piping, and premises. Compare drawings with existing conditions. Report any observed discrepancies. It shall be the Contractor's responsibility to properly coordinate the work and to identify problems in a timely manner. Written instructions will be issued to resolve discrepancies.
- 1.7.7 Because of the small scale of the drawings, it is not possible to indicate all offsets and fittings or to locate every accessory. Drawings are essentially diagrammatic. Study carefully the sizes and locations of structural members, wall and partition locations, trusses, and room dimensions and take actual measurements on the job. Locate piping, ductwork, equipment and accessories with sufficient space for installing and servicing. Contractor is responsible for accuracy of his measurements and for coordination with all trades. Contractor shall not order materials or perform work without such verification. No extra compensation will be allowed because field measurements vary from the dimensions on the drawings. If field measurements show that equipment or piping cannot be fitted, the Architect/Engineer shall be consulted. Remove and relocate, without additional compensation, any item that is installed and is later found to encroach on space assigned to another use.
- 1.8 Guarantee:
- 1.8.1 The Contractor shall guarantee labor, materials and equipment for a period of one (1) year from Final Completion, or from Owner's occupancy, whichever is earlier. Contractor shall make good any defects and shall include all necessary adjustments to and replacement of defective items without expense to the Owner.
- 1.8.2 Owner reserves right to make emergency repairs as required to keep equipment in operation without voiding Contractor's Guarantee Bond nor relieving Contractor of his responsibilities during guarantee period.
- 1.9 Approval Submittals:

- 1.9.1 When approved, the submittal control log and submittals shall be an addition to the specifications herewith, and shall be of equal force in that no deviation will be permitted except with the approval of the Architect/Engineer.
- 1.9.1.1 Shop drawings, product literature, and other approval submittals will only be reviewed if they are submitted in full accordance with the General and Supplementary Conditions and Division 1 Specification sections and the following.
  - 1.9.1.1.1 Submittals shall be properly organized in accordance with the approved submittal control log.
  - 1.9.1.1.2 Submittals shall not include items from more than one specification section in the same submittal package unless approved in the submittal control log.
  - 1.9.1.1.3 Submittals shall be properly identified by a cover sheet showing the project name, Architect and Engineer names, submittal control number, specification section, a list of products or item names with model numbers in the order they appear in the package, and spaces for approval stamps. A sample cover sheet is included at the end of this section.
  - 1.9.1.1.4 Submittals shall have been reviewed and approved by the General Contractor (or Prime Contractor). Evidence of this review and approval shall be an "Approved" stamp with a signature and date on the cover sheet.
  - 1.9.1.1.5 Submittals that include a series of fixtures or devices (such as plumbing fixtures or valves) shall be organized by the fixture number or valve type and be marked accordingly. Each fixture must include all items associated with that fixture regardless of whether or not those items are used on other fixtures.
  - 1.9.1.1.6 The electrical design shown on the drawings supports the mechanical equipment basis of design specifications at the time of design. If mechanical equipment is submitted with different electrical requirements, it is the responsibility of the mechanical contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the mechanical submittal with a written statement that this change will be provided at no additional cost. Mechanical submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost.
- 1.9.2 If the shop drawings show variation from the requirements of contract because of standard shop practice or other reasons, the Contractor shall make specific mention of such variation in writing in his letter of transmittal and on the submittal cover sheet in order that, if acceptable, Contractor will not be relieved of the responsibility for executing the work in accordance with the contract.
- 1.9.3 Review of shop drawings, product literature, catalog data, or schedules shall not relieve the Contractor from responsibility for deviations from contract drawings or specifications, unless he has in writing called to the attention of the Architect/Engineer each such deviation in writing at the time of submission, nor shall it relieve him from responsibility for errors of any sort in shop drawings, product literature, catalog data, or schedules. Any feature or function specified but not mentioned in the submittal shall be assumed to be included per the specification.

- 1.9.4 Submit shop drawings as called for in other sections after award of the contract and before any material is ordered or fabricated. Shop drawings shall consist of plans, sections, elevations and details to scale (not smaller than ¼" per foot), with dimensions clearly showing the installation. Direct copies of small scale project drawings issued to the Contractor are not acceptable. Drawings shall take into account equipment furnished under other sections and shall show space allotted for it. Include construction details and materials.
- 1.10 Test Reports and Verification Submittals: Submit test reports, certifications and verification letters as called for in other sections. Contractor shall coordinate the required testing and documentation of system performance such that sufficient time exists to prepare the reports, submit the reports, review the reports and take corrective action within the scheduled contract time.
- 1.11 O&M Data Submittals: Submit Operation and Maintenance data as called for in other sections. When a copy of approval submittals is included in the O&M Manual, only the final "Approved" or "Approved as Noted" copy shall be used. Contractor shall organize these data in the O&M Manuals tabbed by specification number. Prepare O&M Manuals as required by Division 1 and as described herein.. Submit manuals at the Substantial Completion inspection.

## 2 PRODUCTS

- 2.1 All materials shall be new or Owner-supplied reused as shown on the drawings, the best of their respective kinds, suitable for the conditions and duties imposed on them at the building and shall be of reputable manufacturers. The description, characteristics, and requirements of materials to be used shall be in accordance with qualifying conditions established in the following sections.
- 2.2 Equipment and Materials:
- 2.2.1 Shall be new and the most suitable grade for the purpose intended. Equipment furnished under this division shall be the product of a manufacturer regularly engaged in the manufacture of such items for a period of three years. Where practical, all of the components shall be products of a single manufacturer in order to provide proper coordination and responsibility. Where required, Contractor shall furnish proof of installation of similar units or equipment.
- 2.2.2 Each item of equipment shall bear a name plate showing the manufacturer's name, trade name, model number, serial number, ratings and other information necessary to fully identify it. This plate shall be permanently mounted in a prominent location and shall not be concealed, insulated or painted.
- 2.2.3 The label of the approving agency, such as UL, IBR, ASME, ARI, AMCA, by which a standard has been established for the particular item shall be in full view.
- 2.2.4 The equipment shall be essentially the standard product of a manufacturer regularly engaged in the production of such equipment and shall be a product of the manufacturer's latest design.
- 2.2.5 A service organization with personnel and spare parts shall be available within two hours for each type of equipment furnished.
- 2.2.6 Install in accordance with manufacturer's recommendations. Place in service by a factory trained representative where required.

2.2.7 Materials and equipment are specified herein by a single or by multiple manufacturers to indicate quality, material and type of construction desired. Manufacturer's products shown on the drawings have been used as basis for design; it shall be the Contractor's responsibility to ascertain that alternate manufacturer's products, or the particular products of named manufacturers, meet the detailed specifications and that size and arrangement of equipment are suitable for installation.

2.2.8 Model Numbers: Catalog numbers and model numbers indicated in the drawings and specifications are used as a guide in the selection of the equipment and are only listed for the contractor's convenience. The contractor shall determine the actual model numbers for ordering materials in accordance with the written description of each item and with the intent of the drawings and specifications.

2.3 Requests for Substitution:

2.3.1 Where a particular system, product or material is specified by name, consider it as standard basis for bidding, and base proposal on the particular system, product or material specified.

2.3.2 Requests by Contractor for substitution will be considered only when reasonable, timely, fully documented, and qualifying under one or more of the following circumstances.

2.3.2.1 Required product cannot be supplied in time for compliance with Contract time requirements.

2.3.2.2 Required product is not acceptable to governing authority, or determined to be non-compatible, or cannot be properly coordinated, warranted or insured, or has other recognized disability as certified by Contractor.

2.3.2.3 Substantial cost advantage is offered Owner after deducting offsetting disadvantages including delays, additional compensation for redesign, investigation, evaluation and other necessary services and similar considerations.

2.3.3 All requests for substitution shall contain a "Comparison Schedule" and clearly and specifically indicate any and all differences or omissions between the product specified as the basis of design and the product proposed for substitution. Differences shall include but shall not be limited to data as follows for both the specified and substituted products:

Principal of operation.

Materials of construction or finishes.

Thickness of gauge of materials.

Weight of item.

Deleted features or items.

Added features or items.

Changes in other work caused by the substitution.

Performance curves.

If the approved substitution contains differences or omissions not specifically called to the attention of the Architect/Engineer, the Owner reserves the right to require equal or similar features to be added to the substituted products (or to have the substituted products replaced) at the Contractor's expense.

### 3 EXECUTION

- 3.1 Workmanship: All materials and equipment shall be installed and completed in a first-class workmanlike manner and in accordance with the best modern methods and practice. Any materials installed which do not present an orderly and reasonably neat and/or workmanlike appearance, or do not allow adequate space for maintenance, shall be removed and replaced when so directed by the Architect/Engineer.
- 3.2 Coordination:
- 3.2.1 The Contractor shall be responsible for full coordination of the mechanical systems with shop drawings of the building construction so the proper openings and sleeves or supports are provided for piping, ductwork, or other equipment passing through slabs or walls.
- 3.2.2 Any additional steel supports required for the installation of any mechanical equipment, piping, or ductwork shall be furnished and installed under the section of the specifications requiring the additional supports.
- 3.2.3 It shall be the Contractor's responsibility to see that all equipment such as valves, dampers, filters and such other apparatus or equipment that may require maintenance and operation are made easily accessible, regardless of the diagrammatic location shown on the drawings.
- 3.2.4 All connections to fixtures and equipment shown on the drawings shall be considered diagrammatic unless otherwise indicated by detail. The actual connections shall be made to fully suit the requirements of each case and adequately provide for expansion and servicing.
- 3.2.5 The contractor shall protect equipment, material, and fixtures at all times. He shall replace all equipment, material, and fixtures which are damaged as a result of inadequate protection.
- 3.2.6 Prior to starting and during progress of work, examine work and materials installed by others as they apply to work in this division. Report conditions which will prevent satisfactory installation.
- 3.2.7 Start of work will be construed as acceptance of suitability of work of others.
- 3.3 Interruption of Service: Before any equipment is shut down for disconnecting or tie-ins, arrangements shall be made with the Architect/Engineer and this work shall be done at the time best suited to the Owner. This will typically be on weekends and/or holidays and/or after normal working hours. Services shall be restored the same day unless prior arrangements are made. All overtime or premium costs associated with this work shall be included in the base bid.
- 3.4 Phasing: Provide all required temporary valves, piping, ductwork, equipment and devices as required. Maintain temporary services to areas as required. Remove all temporary material and equipment on completion of work unless Engineer concurs that such material and equipment would be beneficial to the Owner on a permanent basis.
- 3.5 Cutting and Patching: Notify General Contractor to do all cutting and patching of all holes, chases, sleeves, and other openings required for installation of equipment furnished and installed under this section. Utilize experienced trades for cutting and patching. Obtain permission from Architect/Engineer before cutting any structural items.

- 3.6 Equipment Setting: Bolt equipment directly to concrete pads or vibration isolators as required, using hot-dipped galvanized anchor bolts, nuts and washers. Level equipment.
- 3.7 Painting: Touch-up factory finishes on equipment located inside and outside shall be done under Division 15. Obtain matched color coatings from the manufacturer and apply as directed. If corrosion is found during inspection on the surface of any equipment, clean, prime, and paint, as required.
- 3.8 Clean-up: Thoroughly clean all exposed parts of apparatus and equipment of cement, plaster, and other materials and remove all oil and grease spots. Repaint or touch up as required to look like new. During progress of work, contractor is to carefully clean up and leave premises and all portions of building free from debris and in a clean and safe condition.
- 3.9 Start-up and Operational Test: Start each item of equipment in strict accordance with the manufacturer's instructions; or where noted under equipment specification, start-up shall be done by a qualified representative of the manufacturer. Alignment, lubrication, safety, and operating control shall be included in start-up check.
- 3.10 Climate Control: Operate heating and cooling systems as required after initial startup to maintain temperature and humidity conditions to avoid freeze damage and warping or sagging of ceilings and carpet.
- 3.11 Record Drawings:
- 3.11.1 During the progress of the work the Contractor shall record on their field set of drawings the exact location, as installed, of all piping, ductwork, equipment, and other systems which are not installed exactly as shown on the contract drawings.
- 3.11.2 Upon completion of the work, record drawings shall be prepared as described in the General Conditions, Supplementary Conditions, and Division 1 sections.
- 3.12 Acceptance:
- 3.12.1 Punch List: Submit written confirmation that all punch lists have been checked and the required work completed.
- 3.12.2 Instructions: At completion of the work, provide a competent and experienced person who is thoroughly familiar with project, for one day to instruct permanent operating personnel in operation of equipment and control systems. This is in addition to any specific equipment operation and maintenance training.
- 3.12.3 Operation and Maintenance Manuals: Furnish four complete manuals bound in ring binders with Table of Contents, organized, and tabbed by specification section. Manuals shall contain:
- Detailed operating instructions and instructions for making minor adjustments.
  - Complete wiring and control diagrams.
  - Routine maintenance operations.
  - Manufacturer's catalog data, service instructions, and parts lists for each piece of operating equipment.
  - Copies of approved submittals.

Copies of all manufacturer's warranties.  
Copies of test reports and verification submittals.

- 3.12.4 Record Drawings: Submit record drawings.
- 3.12.5 Test and Balance Report: Submit four certified copies. The Report shall be submitted for review prior to the Substantial Completion Inspection unless otherwise required by Division 1.
- 3.12.6 Acceptance will be made on the basis of tests and inspections of job. A representative of firm that performed test and balance work shall be in attendance to assist. Contractor shall furnish necessary mechanics to operate system, make any necessary adjustments and assist with final inspection.
- 3.12.7 Control Diagrams: Frame under glass and mount on equipment room wall.

PROJECT NAME  
PROJECT NUMBER

**This is a sample cover sheet. Use one for each shop drawing.**

ARCHITECT/ENGINEER: Watford Engineering, Inc.

CONTRACTOR: XYZ Construction

SUBCONTRACTOR: ABC Mechanical Contractor

SUPPLIER: Jones Supply Co.

MANUFACTURER: Various

DATE: 2/15/2005

SECTION: 15545/Hydronic Specialties

**Use whatever standard headings you want here**

1. Vent valves - Hoffman No. 62

**List each item separately**

2. In-line air separators - Bell & Gossett RL-4

**Typical - list mfr name & model number**

3. Diaphragm type compression tanks - Bell & Gossett B-200

4. Pump suction diffusers - Bell & Gossett ED-3

5. Triple duty valves - Bell & Gossett 3D-4S

6. Shot feeders - J. Woods No. 2

7. Pressure relief valves - Watts No. 6

8. Pressure reducing valves - Bell & Gossett No. 7

**General Contractor's APPROVAL stamp must be on submittal.**

END OF SECTION 15005

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## SECTION 15020 - CODES AND STANDARDS

### 1 GENERAL

- 1.1 The work covered by this division consists of providing all labor, equipment and materials and performing all operations necessary for the installation of the mechanical work as herein called for and shown on the drawings.
- 1.2 This is a Basic Mechanical Requirements section. Provisions of this section apply to work of all Division 15 sections.

### 2 CODES

- 2.1 All work under Division 15 shall be constructed in accordance with the codes listed herein. The design has been based on the requirements of these codes; and while it is not the responsibility of the Contractor to verify that all work called for complies with these codes, he shall be responsible for calling to the Architect/Engineer's attention any drawings or specifications that are not in conformance with these or other codes prior to ordering equipment or installing work.
- 2.2 Comply with regulations and codes of utility suppliers.
- 2.3 Where no specific method or form of construction is called for in the contract documents, the Contractor shall comply with code requirements when carrying out such work.
- 2.4 Where code conflict exists, generally the most restrictive requirement applies. Comply with current code edition, unless noted.
- 2.5 Additional codes or standards applying to a specific part of the work may be included in that section.
- 2.6 The following codes govern the work:
- 1) Florida Building Code Eighth Edition, 2023 Building
  - 2) Florida Building Code Eighth Edition, 2023 Plumbing
  - 3) Florida Building Code Eighth Edition, 2023 Fuel Gas
  - 4) Florida Building Code Eighth Edition, 2023 Mechanical
  - 5) Florida Fire Prevention Code Eighth Edition
  - 6) National Electric Code (NFPA 70).
  - 7) Life Safety Code (NFPA 101).
  - 8) Installation of Air Conditioning and Ventilation Systems (NFPA 90A)
  - 9) Florida Building Code Eighth Edition, 2023 Energy
  - 10) Florida Building Code Eighth Edition, 2023 Accessibility
  - 11) Florida Americans with Disabilities Accessibility Implementation Act (October 1, 1993) as described in Accessibility Requirements Manual, Department of Community Affairs (January 1, 1997).
  - 12) Americans with Disabilities Act Accessibility Guidelines (ADAAG), January, 1994.

### 3 STANDARDS

All mechanical materials, installation and systems shall meet the requirements of the following standards, including the latest addenda and amendments, to the extent referenced:

- 1) Underwriters' Laboratories (UL)
- 2) American National Standards Institution (ANSI)
- 3) American Society of Testing Materials (ASTM)
- 4) National Fire Protection Association (NFPA)
- 5) National Electrical Manufacturers Association (NEMA)
- 6) Air Conditioning and Refrigeration Institute (ARI)
- 7) Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
- 8) American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)
- 9) Air Movement and Control Association (AMCA)

END OF SECTION 15020

## SECTION 15030 - MECHANICAL RELATED WORK

### 1 GENERAL REQUIREMENTS

- 1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- 1.2 This is a Basic Mechanical Requirements section. Provisions of this section apply to work of all Division 15 sections.
- 1.3 Coordinate with the General Contractor for all cutting and patching. Contractors performing Division 15 work shall inform the General Contractor of all cutting and patching required prior to bidding and shall coordinate installation.

### 2 SITE WORK

- 2.1 Specific requirements for excavation and backfill for underground piping are contained in Section 15190.
- 2.2 Refer to Division 2, Sitework for:
  - 2.2.1 All water, sewer, and storm water piping greater than five feet from the building.

### 3 CONCRETE

- 3.1 Refer to Division 3, Concrete for:
  - 3.1.1 Rough grouting in and around mechanical work.
  - 3.1.2 Patching concrete cut to accommodate mechanical work.

### 4 MASONRY

- 4.1 Refer to Division 4, Masonry for:
  - 4.1.1 Installation of wall louvers.
  - 4.1.2 Installation of access doors in walls.

### 5 METALS

- 5.1 Refer to Division 5, Metals for:
  - 5.1.1 Framing openings for mechanical equipment.
- 5.2 The following is part of Division 15 work.
  - 5.2.1 Supports for mechanical work.
- 5.3 The following is part of Division 15 work, complying with the requirements of Division 7.

5.3.1 Fire barrier penetration seals.

## 6 FINISHES

6.1 Refer to Division 9, Finishes for:

6.1.1 Painting access panels.

6.1.2 Painting color-coded mechanical work indicated for continuous painting. See color schedule in Division 15 section, "Mechanical Identification".

6.1.3 Installation of access doors in gypsum drywall.

6.2 Colors shall be selected by the Architect for all painting of exposed mechanical work in occupied spaces, unless specified herein. Do not paint insulated or jacketed surfaces.

6.3 Perform the following as part of Division 15 work:

6.3.1 Touch up painting of factory finishes.

6.3.2 Painting of all hangers.

6.4 Provide the following as part of Division-15 work:

6.4.1 All ducts, fans, connections, and related devices to make kitchen hoods operational.

6.4.2 All trim including faucets, waste connections, drain traps, vents, valves, piping, flashing, fittings, strainers, and other materials necessary to make equipment operational. Provide rough-in for all equipment. Provide final connections for all equipment.

6.4.3 All fixtures specified in Section 15430.

## 7 ELECTRICAL

7.1 Mechanical contractor shall coordinate the exact electrical requirements of all mechanical equipment being provided with the electrical contractor. Where approval submittals are required, this coordination shall be accomplished prior to making the submittals. The electrical design shown on the drawings supports the mechanical equipment basis of design. If mechanical equipment is submitted with different electrical requirements, it is the responsibility of the mechanical contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the mechanical submittal with a written statement that this design will be provided at no additional cost. Mechanical submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost.

7.2 Mechanical contractor shall provide all HVAC control wiring including the Energy Management Control system sensors, alarms, and input/output signals and all relays, interlocks, warning lights, and control devices, in conduit and complying with the

requirements of Division 16. The intent is for the mechanical contractor to be responsible for the entire HVAC control system, including point-to-point wiring.

- 7.3 Electrical contractor shall provide disconnect switches, starters, and contactors for mechanical equipment unless specifically noted as being furnished as part of mechanical equipment.
- 7.4 Electrical contractor shall provide all power wiring, raceway and devices, and make final electrical connections to all mechanical equipment, switches, starters, contactors, controllers, and similar equipment.

END OF SECTION 15030

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## SECTION 15105 - PIPES AND PIPE FITTINGS

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 section making reference to pipes and pipe fittings specified herein.
- 1.3 Extent of pipes and pipe fittings required by this section is indicated on drawings and/or specified in other Division-15 sections.
- 1.4 Codes and Standards:
- 1.4.1 Brazing: Certify brazing procedures, brazers, and operators in accordance with ASME Boiler and Pressure Vessel Code, Section IX, for shop and job-site brazing of piping work.
- 1.5 Test Report and Verification Submittals:
- 1.5.1 Submit brazing certification for all brazing installers.

### 2 PRODUCTS

- 2.1 Piping Materials: Provide pipe and tube of type, joint type, grade, size and weight (wall thickness or Class) indicated for each service. Where type, grade or class is not indicated, provide proper selection as determined by Installer for installation requirements, and comply with governing regulations and industry standards.
- 2.2 Pipe/Tube Fittings: Provide factory-fabricated fittings of type, materials, grade, class and pressure rating indicated for each service and pipe size. Provide sizes and types matching pipe, tube, valve or equipment connection in each case. Where not otherwise indicated, comply with governing regulations and industry standards for selections, and with pipe manufacturer's recommendations where applicable.
- 2.3 Piping Materials/Products:
- 2.3.1 Soldering Materials:
- 2.3.1.1 Tin-Antimony (95-5) Solder: ASTM B-32, Grade 95TA.
- 2.3.1.2 Silver-Phosphorus Solder: ASTM B-32, Grade 96TS.
- 2.3.2 Pipe Thread Tape: Teflon tape.
- 2.3.3 Protective Coating: Koppers Bitumastic No. 505 or equal.
- 2.3.4 Gaskets for Flanged Joints: ANSI B16.21; full-faced for cast iron flanges; raised-face for steel flanges, unless otherwise noted.

2.3.5 Welding Materials: Comply with Section II, Part C, ASME Boiler and Pressure Vessel Code for welding materials. Materials shall be determined by installer to comply with installation requirements.

2.3.6 Brazing Materials: Silver content of not less than 15%. Materials shall be determined by installer to comply with installation requirements.

2.4 Copper Tube and Fittings:

2.4.1 Copper Tube:

2.4.1.1 Copper Tube: ASTM B88; Type K or L as indicated for each service; hard-drawn temper unless specifically noted as annealed.

2.4.1.2 ACR Copper Tube: ASTM B280.

2.4.2 Fittings:

2.4.2.1 Wrought-Copper Solder-Joint Fittings: ANSI B16.22.

2.4.2.2 Copper Tube Unions: Provide standard products recommended by manufacturer for use in service indicated.

2.4.2.3 Wrought-Copper Solder-Joint Drainage Fittings: ANSI B16.29.

2.4.2.4 Cast-Copper Flared Tube Fittings: ANSI B16.26.

2.5 Plastic Pipes and Fittings:

2.5.1 Pipes:

2.5.1.1 PVC DWV Pipe: ASTM D-2665, Schedule 40.

2.5.1.2 PVC Sewer Pipe: ASTM D-3034.

2.5.2 Fittings:

2.5.2.1 PVC Solvent Cement: ASTM D-2564.

2.5.2.2 PVC DWV Socket: ASTM D-2665.

2.5.2.3 PVC Sewer Socket: ASTM D-3034.

2.5.2.4 PVC Schedule 40 Socket: ASTM D-2466.

3 EXECUTION

3.1 Installation

3.1.1 General: Install pipes and pipe fittings in accordance with recognized industry practices which will achieve permanently-leak proof piping systems, capable of performing each indicated

service without piping failure. Install each run with minimum joints and couplings, but with adequate and accessible unions for disassembly and maintenance or replacement of valves and equipment. Reduce sizes (where indicated) by use of reducing fittings, not bushings. Align piping accurately at connections, within 1/16" misalignment tolerance.

- 3.1.2 Comply with ANSI B31 Code for Pressure Piping.
- 3.1.3 Locate piping runs, except as otherwise indicated, vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown or described by diagrams, details and notations or, if not otherwise indicated, run piping in shortest route which does not obstruct usable space or block access for servicing building and its equipment. Hold piping close to walls, overhead construction, columns and other structural and permanent-enclosure elements of building; limit clearance to ½" where furring is shown for enclosure or concealment of piping, but allow for insulation thickness, if any. Where possible, locate insulated piping for 1" clearance outside insulation.
- 3.1.4 Concealed Piping: Unless specifically noted as "Exposed" on the drawings, conceal piping from view in finished and occupied spaces, by locating in column enclosures, chases, in hollow wall construction or above suspended ceilings; do not encase horizontal runs in solid partitions, except as indicated.
- 3.1.5 Electrical Equipment Spaces: Do not run piping through transformer vaults and other electrical, communications, or data equipment spaces and enclosures unless shown. Install drip pan under piping that must run through electrical spaces.
  - 3.1.5.1 Cut pipe from measurements taken at the site, not from drawings. Keep pipes free of contact with building construction and installed work.
- 3.2 Piping System Joints: Provide joints of the type indicated in each piping system.
  - 3.2.1 Solder copper tube-and-fitting joints where indicated, in accordance with recognized industry practice. Cut tube ends squarely, ream to full inside diameter, and clean outside of tube ends and inside of fittings. Apply non-acid type solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens.
  - 3.2.2 Thread pipe in accordance with ANSI B2.1; cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound, or pipe joint tape (Teflon) where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave not more than 3 threads exposed. Paint exposed threads to retard rusting.
  - 3.2.3 Flanged Joints: Match flanges within piping system, and at connection with valves and equipment. Clean flange faces and install gaskets. Tighten bolts to provide uniform compression of gaskets. Bolts shall project 1/8" to 3/8" beyond nut face when tight.
  - 3.2.4 Plastic Pipe Joints: Comply with manufacturer's instructions and recommendations, and with applicable industry standards.
    - 3.2.4.1 Solvent-cemented joints shall be made in accordance with ASTM D-2235 and ASTM F-402.

- 3.2.4.2 PVC sewer pipe bell/gasket joints shall be installed in accordance with ASTM D-2321.
- 3.2.5 Braze copper tube-and-fitting joints where indicated, in accordance with ANSI B.31.
- 3.3 Piping Installation
- 3.3.1 Install piping to allow for expansion and contraction.
- 3.3.2 Isolate all copper tubing from steel and concrete by wrapping the pipe at the contact point, and for one inch on each side, with a continuous plastic sleeve. Isolate all copper tubing installed in block walls with a continuous plastic sleeve.
- 3.3.3 Underground Piping:
- 3.3.3.1 Provide plastic tape markers over all underground piping. Provide copper wire over all underground plastic piping. Locate markers 18" above piping.
- 3.3.3.2 Coat the following underground (uninsulated) pipes with a heavy coat of bitumastic or provide an 8 mil polyvinyl sleeve: black steel pipe, galvanized steel pipe, copper tubing.

END OF SECTION 15105

## SECTION 15110 - VALVES

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to the work of this section.
- 1.2 This section is a Division-15 Basic Materials and Methods section, and is part of each Division-15 section making reference to or requiring valves specified herein.
- 1.3 Extent of valves required by this section is indicated on drawings and/or specified in other Division-15 sections.
- 1.4 Quality Assurance:
- 1.4.1 Valve Dimensions: For face-to-face and end-to-end dimensions of flanged or welding-end valve bodies, comply with ANSI B16.10.
- 1.4.2 Valve Types: Provide valves of same type by same manufacturer.
- 1.5 Approval Submittals: When required by other Division-15 sections, submit product data, catalog cuts, specifications, and dimensioned drawings for each type of valve. Include pressure drop curve or chart for each type and size of valve. Submit valves with Division-15 section using the valves, not as a separate submittal. For each valve, identify systems where the valve is intended for use.
- Gate Valves. Type GA.  
Check Valves. Type CK.  
Ball Valves. Type BA.
- 1.6 O&M Data Submittals: Submit a copy of approval submittals. Submit installation instructions, maintenance data and spare parts lists for each type of valve. Include this data in the O&M Manual.

### 2 PRODUCTS

- 2.1 General: Provide factory-fabricated valves recommended by manufacturer for use in service indicated. Provide valves of types and pressure ratings indicated; provide proper selection as determined by Installer to comply with specifications and installation requirements. Provide sizes as indicated, and connections which properly mate with pipe, tube, and equipment connections.
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide valves of one of the producers listed for each valve type. The model numbers are listed for contractor's convenience only. In the case of a model number discrepancy, the written description shall govern.
- 2.3 Gate Valves:
- 2.3.1 Packing: Select valves designed for repacking under pressure when fully opened, equipped with non-asbestos packing suitable for intended service. Select valves designed so back seating

protects packing and stem threads from fluid when valve is fully opened, and equipped with gland follower.

2.3.2 Comply with the following standards:

Cast Iron Valves: MSS SP-70. Cast Iron Gate Valves, Flanged and Threaded Ends.

Bronze Valves: MSS SP-80. Bronze Gate, Globe, Angle and Check Valves.

Steel Valves: ANSI B16.34. Steel Standard Class Valve Ratings.

2.3.3 Types of gate (GA) valves:

- 1 Threaded Ends 2" and Smaller (GA1): Class 125, bronze body, screwed bonnet, rising stem, solid wedge. Stockham B-100. Nibco T-111. Crane 428. Milwaukee 148.
- 2 Soldered Ends 2" and Smaller (GA2): Class 125, bronze body, screwed bonnet, non-rising stem, solid wedge. Stockham B-108 or B-109. Nibco S-111. Crane 1334. Milwaukee 149.
- 3 Flanged Ends 2½" and Larger (GA3): Class 125, iron body, bronze mounted, bolted bonnet, rising stem, OS&Y, solid wedge. Stockham G-623. Nibco F617-0. Crane 465½. Milwaukee F2885.
- 4 Threaded Ends 2" and Smaller (GA4): Class 150, bronze body, screwed bonnet, rising stem, solid wedge. Stockham B-122. Nibco T-131. Crane 431. Milwaukee 1150.
- 5 Soldered Ends 2" and Smaller (GA5): Class 150, bronze body, screwed bonnet, rising stem, solid wedge. Stockham B-124. Nibco S-134. Milwaukee 1169.
- 6 Threaded Ends 2" and Smaller (GA6): 175 WWP, bronze body, screwed bonnet, rising stem, OS&Y, solid wedge, UL-listed. Stockham B-133. Nibco T-104-0.
- 7 Flanged Ends 2½" and Larger (GA7): 175 WWP, iron body, bolted bonnet, rising stem, OS&Y, solid wedge, UL listed. Stockham G-634. Nibco F-607-OTS
- 8 Threaded Ends 2" and Smaller (GA8): Class 200, bronze body, union bonnet, rising stem, solid wedge, renewable seat. Stockham B-132. Nibco T-154-SS. Milwaukee 1174.
- 9 Flanged Ends 2½" and Larger (GA9): Class 250, iron body bronze mounted, bolted bonnet, rising stem, OS&Y, solid wedge. Stockham F-667. Nibco F-667-0. Crane 7½E. Milwaukee F-2894.
- 10 Threaded Ends 2" and Smaller (GA10): Class 300, bronze body, union bonnet, rising stem, solid wedge, renewable seat. Stockham B-145. Nibco T-174-SS. Crane 634E. Milwaukee 1184.
- 11 Flanged Ends 2½" and Larger (GA11): Class 300, cast steel body, bolted bonnet, rising stem, solid wedge, seal-welded seat rings. Provide trim to match use. Stockham 30-0F. Crane 33.
- 12 Flanged Ends 2½" and Larger (GA12): 300 WWP, iron body, bolted bonnet, bronze

mounted, rising stem, OS&Y, solid wedge, UL-listed. Stockham F-670. Nibco F-697-0.

## 2.4 Check Valves:

2.4.1 Construction: Construct valves of castings free of any impregnating materials. Construct valves with a bronze regrinding disc with a seating angle of 40° to 45°, unless a composition disc is specified. Provide stop plug as renewable stop for disc hanger, unless otherwise specified. Disc and hanger shall be separate parts with disc free to rotate. Support hanger pins on both ends by removable side plugs.

2.4.2 Comply with the following standards:

Cast Iron Valves: MSS SP-71. Cast Iron Swing Check Valves, Flanged and Threaded Ends.

Bronze Valves: MSS SP-80. Bronze Gate, Globe, Angle and Check Valves.

Steel Valves: ANSI B16.34. Steel Standard Class Valve Ratings.

2.4.3 Types of check (CK) valves:

- 1 Threaded Ends 2" and Smaller (CK1): Class 125, bronze body, screwed cap, horizontal swing, bronze disc. Stockham B-319. Nibco T-413-BY. Crane 1707. Milwaukee 509.
- 2 Soldered Ends 2" and Smaller (CK2): Class 125, bronze body, screwed cap, horizontal swing, bronze disc. Stockham B-309. Nibco S-413-B. Crane 1707S. Milwaukee 1509.
- 3 Flanged Ends 2½" and Larger (CK3): Class 125, iron body, bronze-mounted, bolted cap, horizontal swing, cast-iron or composition disc. Stockham G-931 or G-932 as applicable. Nibco F918-B. Crane 373. Milwaukee F2974 as applicable.
- 4 Threaded Ends 2" and Smaller (CK4): 200 WWP, bronze body, screwed cap, horizontal swing, regrinding type bronze disc, for fire sprinkler use. Nibco KT-403-W.
- 5 Flanged Ends 2½" and Larger (CK5): 175 WWP, iron body, bolted cap, bronze mounted, composition disc, UL listed, with ball drip if required. Stockham G-940. Nibco F-908-W.
- 6 Threaded Ends 2" and Smaller (CK6): Class 200, bronze body, screwed cap, Y-pattern swing, regrinding bronze disc. Stockham B-345. Nibco T-453-B. Crane 36. Milwaukee 518/508.
- 7 Flanged Ends 2½" and Larger (CK7): Class 250, iron body, bronze mounted, bolted cap, cast-iron disc. Stockham F-947. Nibco F-968-B. Crane 39E. Milwaukee F2970.
- 8 Threaded Ends 2" and Smaller (CK8): Class 300, bronze body, screwed cap, Y-pattern swing, regrinding bronze disc. Stockham B-375. Nibco T-473-B. Crane 76E. Milwaukee 517/507.
- 9 Flanged Ends 2½" and Larger (CK9): Class 300, cast steel body, bolted cap, horizontal swing, seal welded seat rings, chromium stainless disc. Stockham 30-SF. Crane 159.

## 2.5 Ball Valves:

2.5.1 General: Select with port area equal to or greater than connecting pipe area, include seat ring

designed to hold sealing material.

2.5.2 Construction: Ball valves shall be rated for 150 psi saturated steam and 600 psi non-shock cold water. Pressure containing parts shall be constructed of ASTM B-584 alloy 844, or ASTM B-124 alloy 377. Valves shall be furnished with blow-out proof bottom loaded stem constructed of ASTM B-371 alloy 694 or other approved low zinc material. Provide TFE packing, TFE thrust washer, chrome-plated ball and reinforced teflon seats. Valves 1" and smaller shall be full port design. Valves 1¼" and larger shall be conventional port design. Stem extensions shall be furnished for use in insulated piping where insulation exceeds ½" thickness.

2.5.3 Comply with the following standards:

MSS SP-72. Ball Valves with Flanged or Butt Welding Ends for General Service.

MSS SP-110. Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

2.5.4 Types of ball (BA) valves:

- 1 Threaded Ends 2" and Smaller (BA1): Bronze two-piece full port body with adjustable stem packing. Nibco T-585-70. Stockham S216-BR-R-T. Milwaukee BA125. Apollo 77-100.
- 2 Soldered Ends 2" and Smaller (BA2): Bronze three-piece full port body with adjustable stem packing. Nibco S-595-Y-66. Milwaukee BA350. Apollo 82-200.
- 3 Threaded Ends 1" and Smaller (BA3): Bronze two-piece full port body, UL listed (UL 842) for use with flammable liquids and LP gas. Nibco T-585-70-UL.
- 4 Threaded Ends 2" and Smaller (BA4): 175 WWP, bronze two-piece body, UL listed for fire protection service. Nibco KT-585-70-UL and KT-580-70-UL.
- 5 Threaded Ends 2" and Smaller (BA5): 400 WWP, bronze two-piece body, for fire protection service. Nibco KT-580.
- 6 Threaded Ends 2½" and Smaller (BA6): 300 WWP, bronze three-piece body, gear operator with handwheel, indicator flag, accepts tamper switch, for fire protection, UL listed. Nibco T-505-4 and G-505-4.
- 7 Flanged Ends 2½" and Larger (BA7): Class 150, carbon steel full bore two-piece body with adjustable stem packing. Nibco F515-CS series. Apollo 88-240.

2.6 Valve Features:

2.6.1 General: Provide valves with features indicated and, where not otherwise indicated, provide proper valve features as determined by Installer for installation requirements. Comply with ANSI B31.1

2.6.2 Valve features specified or required shall comply with the following:

- 1 Flanged: Provide valve flanges complying with ANSI B16.1 (cast iron), ANSI B16.5 (steel), or ANSI B16.24 (bronze).

- 2     Threaded: Provide valve ends complying with ANSI B2.1.
- 3     Solder-Joint: Provide valve ends complying with ANSI B16.18.
- 4     Trim: Fabricate pressure-containing components of valve, including stems (shafts) and seats from brass or bronze materials, of standard alloy recognized in valve manufacturing industry unless otherwise specified.
- 5     Non-Metallic Disc: Provide non-metallic material selected for service indicated in accordance with manufacturer's published literature.
- 6     Renewable Seat: Design seat of valve with removable disc, and assemble valve so disc can be replaced when worn.
- 7     Extended Stem: Increase stem length by 2" minimum, to accommodate insulation applied over valve.

### 3     EXECUTION

#### 3.1    Installation:

- 3.1.1   General: Install valves where required for proper operation of piping and equipment, including valves in branch lines to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward below horizontal plane.
- 3.1.2   Insulation: Where insulation is indicated, install extended-stem valves, arranged in proper manner to receive insulation.
- 3.1.3   Applications Subject to Corrosion: Do not install bronze valves and valve components in direct contact with steel, unless bronze and steel are separated by dielectric insulator.

#### 3.2    Selection of Valve Ends (Pipe Connections): Except as otherwise indicated, select and install valves with the following ends or types of pipe/tube connections:

- 3.2.1   Tube Size 2" and Smaller: Threaded valves.
- 3.2.2   Pipe Size 2" and Smaller: Threaded valves.
- 3.2.3   Pipe Size 2½" and Larger: Flanged valves.

#### 3.3    Non-Metallic Disc: Limit selection and installation of valves with non-metallic disc to locations indicated and where foreign material in piping system can be expected to prevent tight shutoff of metal seated valves.

#### 3.4    Renewable Seats: Select and install valves with renewable seats, except where otherwise indicated.

#### 3.5    Installation of Check Valves: Install in horizontal position with hinge pin horizontally

perpendicular to center line of pipe. Install for proper direction flow.

END OF SECTION 15110.

## SECTION 15120 - PIPING SPECIALTIES

### 1 GENERAL

- 1.1 Drawings and general provisions of contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 section making reference to or requiring piping specialties specified herein.
- 1.3 Approval Submittals:
  - 1.3.1 Product Data: Submit product data with installation instructions and UL listing for:  
Fire barrier sealants.

### 2 PRODUCTS

- 2.1 General: Provide factory-fabricated piping specialties recommended by manufacturer for use in service indicated. Provide piping specialties of types and pressure ratings indicated for each service, or if not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes as indicated, and connections, which properly mate with pipe, tube, and equipment connections. Where more than one type is indicated, selection is Installer's option.
- 2.2 Escutcheons:
  - 2.2.1 General: Provide pipe escutcheons as specified herein with inside diameter closely fitting pipe outside diameter, or outside of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, or ceilings; and pipe sleeve extension, if any. Furnish pipe escutcheons with nickel or chrome finish for occupied areas, prime paint finish for unoccupied areas.
  - 2.2.2 Pipe Escutcheons for Moist Areas: For waterproof floors, and areas where water and condensation can be expected to accumulate, provide cast brass or sheet brass escutcheons, solid or split hinged.
  - 2.2.3 Pipe Escutcheons for Dry Areas: Provide sheet steel escutcheons, solid or split hinged.
- 2.3 Dielectric Unions: Provide standard products recommended by manufacturer for use in service indicated, which effectively isolate ferrous from non-ferrous piping (electrical conductance), prevent galvanic action and stop corrosion.
- 2.4 Fire Barrier Penetration Seals:
  - 2.4.1 Provide seals for any opening through fire-rated walls, floors, or ceilings used as passage for mechanical components such as piping or ductwork in accordance with the requirements of Division 7.

2.5 Fabricated Piping Specialties:

2.5.1 Drip Pans: Provide drip pans fabricated from corrosion-resistant sheet metal with watertight joints, and with edges turned up 2-1/2". Reinforce top, either by structural angles or by rolling top over 1/4" steel rod. Provide hole, gasket, and flange at low point for watertight joint and 1" drain line connection.

2.5.2 Pipe Sleeves: Provide pipe sleeves of one of the following:

2.5.2.1 Sheet-Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate from the following gages: 3" and smaller, 20 gage; 4" to 6" 16 gage; over 6", 14 gage.

2.5.2.2 Steel-Pipe: Fabricate from Schedule 40 galvanized steel pipe; remove burrs.

2.5.2.3 Iron-Pipe: Fabricate from cast-iron or ductile-iron pipe; remove burrs.

2.5.3 Sleeve Seals: Provide sleeve seals for sleeves located in foundation walls below grade, or in exterior walls, of one of the following:

2.5.3.1 Caulking and Sealant: Provide foam or caulking and sealant compatible with piping materials used.

2.6 Low Pressure Y-Type Pipeline Strainers:

2.6.1 General: Provide strainers full line size of connecting piping, with ends matching piping system materials. Provide Type 304 stainless steel screens.

2.6.1.1 Water Strainers: Select for 200 psi working pressure (water, oil or gas). Provide 20 mesh screens through 2" size and 1/16" perforations for 2 1/2" size and larger.

2.6.2 Select from the following types:

2.6.2.1 Threaded Ends, 2" and Smaller: Cast-iron body, screwed screen retainer with centered blowdown fitted with pipe plug.

2.6.2.2 Threaded Ends, 2-1/2" and Larger: Cast-iron body, bolted screen retainer with off-center blowdown fitted with pipe plug.

2.6.2.3 Flanged Ends, 2-1/2" and Larger: Cast-iron body, bolted screen retainer with off-center blowdown fitted with pipe plug.

3 EXECUTION

3.1 Pipe Escutcheons: Install pipe escutcheons on each pipe penetration through floors, walls, partitions, and ceilings where penetration is exposed to view; and on exterior of building. Secure escutcheon to pipe or insulation so escutcheon covers penetration hole, and is flush with adjoining surface.

3.2 Dielectric Unions: Install at each piping joint between ferrous and non-ferrous piping. Comply with manufacturer's installation instructions.

- 3.3 Fire Barrier Penetration Seals: Provide pipe sleeve as required. Fill entire opening with sealing compound. Adhere to manufacturer's installation instructions. Refer to Division 7.
- 3.4 Drip Pans: Locate drip pans under piping passing over or within 3' horizontally of electrical equipment, and elsewhere as indicated. Hang from structure with rods and building attachments, weld rods to sides of drip pan. Brace to prevent sagging or swaying. Connect 1" drain line to drain connection, and run to nearest plumbing drain or elsewhere as indicated.
- 3.5 Pipe Sleeves: Install pipe sleeves of types indicated where piping passes through walls, floors, ceilings, and roofs. Do not install sleeves through structural members of work, except as detailed on drawings, or as reviewed by Architect/Engineer. Install sleeves accurately centered on pipe runs. Size sleeves so that piping and insulation (if any) will have free movement in sleeve, including allowance for thermal expansion; but not less than 2 pipe sizes larger than piping run. Where insulation includes vapor-barrier jacket, provide sleeve with sufficient clearance for installation. Install length of sleeve equal to thickness of construction penetrated, and finish flush to surface; except floor sleeves. Extend floor sleeves ¼" above level floor finish, and ¾" above floor finish sloped to drain. Provide temporary support of sleeves during placement of concrete and other work around sleeves, and provide temporary closure to prevent concrete and other materials from entering sleeves.
- 3.5.1 Install sleeves in fire-rated assemblies in accordance with the listing of the assembly and the fire barrier sealant.
- 3.5.2 Install sheet-metal sleeves at interior partitions and ceilings other than suspended ceilings. Fill annular space with caulking or fire barrier sealant as required.
- 3.5.3 Install steel-pipe sleeves at floor penetrations. Fill annular space with caulking or fire barrier sealant as required.
- 3.5.4 Install iron-pipe sleeves at all foundation wall penetrations and at exterior penetrations; both above and below grade. Fill annular space with caulking or mechanical sleeve seals.

END OF SECTION 15120.

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## SECTION 15135 - VIBRATION ISOLATION

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 section making reference to vibration isolation equipment.
- 1.3 Extent of vibration isolation required by this section is indicated on drawings and/or specified in other Division-15 sections.
- 1.4 Approval Submittals: When required by other Division-15 sections, submit product data sheets for each type of vibration isolation equipment including configuration and rating data. Submit with Division-15 section using vibration isolation, not as a separate submittal. Provide calculations showing supported weight, deflection, and isolator size and type for each item of supported equipment. Submit for:  
  
Equipment Mountings. Type EM.  
Hangers. Type HA.
- 1.5 O&M Data Submittals: Submit a copy of approval submittals for each type of vibration isolation equipment. Include this data in O&M Manual.

### 2 PRODUCTS

- 2.1 General: Provide factory-fabricated products recommended by manufacturer for use in service indicated. Provide products of types and deflections indicated; provide proper selection as determined by Installer to comply with specifications and installation requirements. Provide sizes which properly fit with equipment. All metal parts installed outside shall be hot dipped galvanized after fabrication.
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide vibration isolation equipment of: Mason Industries, Keflex, Consolidated Kinetics, Vibration Mountings & Controls, Wheatley or approved equal. All vibration isolators shall be supplied by a single approved manufacturer.
- 2.3 Equipment Mountings:
- 2.3.1 Select mountings with the required deflection and fastening means. Provide steel rails or bases as required to compensate for equipment rigidity and overhang.
- 2.3.2 Types of equipment mountings (EM):
- 1 Spring Mountings (EM1): Spring isolators shall be free-standing and laterally stable without any housing. All mounts shall have leveling bolts. Spring diameter shall be not less than 0.8 of the compressed height of the spring at rated load. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Springs shall be so designed that the ratio of horizontal stiffness to vertical stiffness is approximately one. Provide a nominal static deflection of at least 1.0". Basis of Design: Mason Industries

SLFH.

- 2 Spring Mountings with Housings (EM2): Spring isolators shall consist of open, stable steel springs and include vertical travel limit stops to control extension when weight is removed. The housing of the spring unit shall serve as blocking during erection of equipment. Provide a nominal static deflection of at least 1.0". All mountings used outside shall be hot dipped galvanized. Basis of Design: Mason Industries SLR.
- 3 Spring Mountings with Housings (EM3): Spring isolators shall consist of open, stable steel springs with neoprene inserts to limit movement between upper and lower housing on start and stop. Provide a nominal static deflection of at least 1.0". Mountings shall be specifically designed for critical areas on light-weight floors. Basis of Design: Mason Industries C.
- 4 Neoprene Mountings (EM4): Double deflection neoprene-in-shear mountings shall have a minimum static deflection of 0.35". All metal surfaces shall be neoprene covered. The top and bottom surfaces shall be neoprene ribbed and bolt holes shall be provided in the base. Basis of design: Mason Industries ND.
- 5 Pads (EM5): Waffle or ribbed pattern neoprene pads shall be fabricated from 40-50 durometer neoprene. Provide rigid steel plate and mounting angles as required. Basis of design: Mason Industries Super W.

#### 2.4 Hangers:

2.4.1 Select hangers with the required deflection. Provide all required hanger rods and fasteners.

#### 2.4.2 Types of hangers (HA):

- 1 Hangers (HA1): Vibration hangers shall contain a steel spring set in a neoprene cup manufactured with a grommet to prevent short-circuiting of the hanger rod. The cup shall contain a steel washer designed to properly distribute the load on the neoprene and prevent its extrusion. Spring diameters and hanger box lower-hole sizes shall be large enough to permit the hanger rod to swing through a 30-degree arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Basis of Design: Mason Industries 30.
- 2 Hangers (HA2): Vibration hangers shall contain a laterally stable steel spring and 0.3" deflection neoprene or fiberglass element in series. A neoprene neck shall be provided where the hanger rod passes through the steel box supporting the isolator mount to prevent metal to metal contact. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30 degree arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Basis of Design: Mason Industries 30N.
- 3 Hangers (HA3): Double deflection neoprene-in-shear or EPDM hangers. Units shall be complete with projected neoprene bushing to prevent steel-to-steel contact between hanger box and hanger rod. Average static deflection shall be not less than 0.4 inches. Basis of Design: Mason Industries HD.

3        EXECUTION

3.1        Install vibration isolation devices for the duty indicated and for ease of inspection, adjustment, and proper operation. Install in accordance with the manufacturer's written instructions and coordinate with shop drawings of supported equipment.

3.2        All connections to fixtures and equipment shown on the drawings shall be considered diagrammatic unless otherwise indicated by detail. The actual connections shall be made to fully suit the requirements of each case and adequately provide for expansion and servicing.

3.3        Piping, ductwork and conduit shall not be suspended from one another or physically contact one another. Vibrating systems shall be kept free from non-vibrating systems.

3.4        Equipment Mountings:

3.4.1      Unless otherwise shown or specified, all floor-mounted equipment shall be set on housekeeping equipment bases. Refer to Division-15 section "Supports, Anchors, and Seals".

3.4.2      No equipment unit shall bear directly on vibration isolators unless its own frame is suitably rigid to span between isolators, and such direct support is approved by the equipment manufacturer. All support frames shall be sufficiently stiff and rigid so as to prevent distortion and misalignment of components installed thereon.

3.4.3      Align equipment mountings for a free, plumb installation. Isolators that are binding, offset or fully compressed will not be accepted.

3.5        Hangers:

3.5.1      Position vibration isolation hangers so that hanger housing may rotate a full 360 degrees without contacting any object.

3.5.2      Install steel angles, channels, rods and fasteners to level equipment, piping or ductwork and to evenly distribute the supported weight.

3.6        Connections of Ducts: Ducts shall be connected to fan intakes and discharges by means of flexible connectors in accordance with Division-15 section "Ductwork Accessories" so that all vibrating equipment is fully isolated.

END OF SECTION 15135.

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## SECTION 15150 - SUPPORTS, ANCHORS, AND SEALS

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-15 Basic Materials and Methods section, and is a part of each Division-15 section making reference to or requiring supports, anchors, and seals specified herein.
- 1.3 Extent of supports, anchors, and seals required by this section is indicated on drawings and/or specified in other Division-15 sections.
- 1.4 Code Compliance: Comply with applicable codes pertaining to product materials and installation of supports, anchors, and seals.
- 1.5 MSS Standard Compliance:
  - 1.5.1 Provide pipe hangers and supports of which materials, design, and manufacture comply with ANSI/MSS SP-58.
  - 1.5.2 Select and apply pipe hangers and supports, complying with MSS SP-69.
  - 1.5.3 Fabricate and install pipe hangers and supports, complying with MSS SP-89.
  - 1.5.4 Terminology used in this section is defined in MSS SP-90.
- 1.6 UL Compliance: Provide products which are Underwriters Laboratories listed.

### 2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide supports and hangers by Grinnel, Michigan Hanger Company, B-Line Systems, or approved equal.
- 2.2 Horizontal-Piping Hangers and Supports: Except as otherwise indicated, provide factory-fabricated horizontal-piping hangers and supports complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit horizontal-piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper-plated hangers and supports for copper-piping systems.
  - 2.2.1 Adjustable Steel Clevises: MSS Type 1.
  - 2.2.2 Steel Double Bolt Pipe Clamps: MSS Type 3.
  - 2.2.3 Adjustable Steel Band Hangers: MSS Type 7.

- 2.2.4 Steel Pipe Clamps: MSS Type 4.
- 2.2.5 Pipe Stanchion Saddles: MSS Type 37, including steel pipe base support and cast-iron floor flange.
- 2.2.6 Single Pipe Rolls: MSS Type 41.
- 2.2.7 Adjustable Roller Hanger: MSS Type 43.
- 2.2.8 Pipe Roll Stands: MSS Type 44 or Type 47.
- 2.3 Vertical-Piping Clamps: Except as otherwise indicated, provide factory-fabricated vertical-piping clamps complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit vertical piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Select size of vertical piping clamps to exactly fit pipe size of bare pipe. Provide copper-plated clamps for copper-piping systems.
  - 2.3.1 Two-Bolt Riser Clamps: MSS Type 8.
  - 2.3.2 Four-Bolt Riser Clamps: MSS Type 42.
- 2.4 Hanger-Rod Attachments: Except as otherwise indicated, provide factory-fabricated hanger-rod attachments complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit horizontal-piping hangers and building attachments, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hanger-rod attachments to suit hanger rods. Provide copper-plated hanger-rod attachments for copper-piping systems.
  - 2.4.1 Steel Turnbuckles: MSS Type 13.
  - 2.4.2 Malleable Iron Sockets: MSS Type 16.
- 2.5 Building Attachments: Except as otherwise indicated, provide factory-fabricated building attachments complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit building substrate conditions, in accordance with MSS SP-69 and manufacturer's published product information. Select size of building attachments to suit hanger rods.
  - 2.5.1 Center Beam Clamps: MSS Type 21.
  - 2.5.2 C-Clamps: MSS Type 23.
  - 2.5.3 Malleable Beam Clamps: MSS Type 30.
  - 2.5.4 Side Beam Brackets: MSS Type 34.
  - 2.5.5 Concrete Inserts: MSS Type 18.
- 2.6 Saddles and Shields: Except as otherwise indicated, provide saddles or shields under piping hangers and supports, factory-fabricated, for all insulated piping. Size saddles and shields for exact fit to mate with pipe insulation.

- 2.6.1 Protection Shields: MSS Type 40; of length recommended by manufacturer to prevent crushing of insulation.
- 2.6.2 Protection Saddles: MSS Type 39; use with rollers, fill interior voids with segments of insulation matching adjoining insulation.
- 2.7 Miscellaneous Materials:
  - 2.7.1 Metal Framing: Provide products complying with NEMA STD ML 1.
  - 2.7.2 Steel Plates, Shapes and Bars: Provide products complying with ANSI/ASTM A 36.
  - 2.7.3 Cement Grout: Portland cement (ANSI/ASTM C 150, Type I or Type III) and clean uniformly graded, natural sand (ANSI/ASTM C 404, Size No. 2). Mix at a ratio of 1.0 part cement to 3.0 parts sand, by volume, with minimum amount of water required for placement and hydration.
  - 2.7.4 Heavy-Duty Steel Trapezes: Fabricate from steel shapes or continuous channel struts selected for loads required; weld steel in accordance with AWS standards.

### 3 EXECUTION

#### 3.1 Preparation

- 3.1.1 Proceed with installation of hangers, supports and anchors only after required building structural work has been completed in areas where the work is to be installed. Correct inadequacies including (but not limited to) proper placement of inserts, anchors and other building structural attachments.
- 3.1.2 Prior to installation of hangers, supports, anchors and associated work, Installer shall meet at project site with Contractor, installer of each component of associated work, and installers of other work requiring coordination with work of this section for purpose of reviewing material selections and procedures to be followed in performing the work in compliance with requirements specified.

#### 3.2 Installation of Building Attachments:

- 3.2.1 Install building attachments at required locations within concrete or on structural steel for proper piping support. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert securely to forms. Where concrete with compressive strength less than 2500 psi is indicated, install reinforcing bars through openings at top of inserts.
- 3.2.2 In areas of work requiring attachments to existing concrete, use self drilling rod inserts, Phillips Drill Co., "Red-Head" or equal.

#### 3.3 Installation of Hangers and Supports:

- 3.3.1 General: Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with MSS SP-69. Arrange for grouping of parallel runs of horizontal piping to be supported together on trapeze type hangers where possible. Install supports with maximum spacings complying with MSS SP-69 or as listed herein, whichever is most limiting. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.
- 3.3.1.1 Horizontal steel pipe and copper tube 1-1/4" diameter and smaller: support on 6 foot centers.
- 3.3.1.2 Horizontal steel pipe and copper tube 1-1/2" diameter and larger: support on 10 foot centers.
- 3.3.1.3 Vertical steel pipe and copper tube: support at each floor.
- 3.3.1.4 Plastic pipe: support in accordance with manufacturer's recommendations.
- 3.3.1.5 Horizontal cast iron pipe inside building: support each length of pipe (at the joint).
- 3.3.1.6 Vertical cast iron pipe: support at each floor and at the base.
- 3.3.2 Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories.
- 3.3.3 Paint all black steel hangers with black enamel. Galvanized steel and copper clad hangers do not require paint.
- 3.3.4 Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated, or by other recognized industry methods.
- 3.3.5 Provision for Movement:
- 3.3.5.1 Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
- 3.3.5.2 Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
- 3.3.5.3 Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ANSI B31 are not exceeded.
- 3.3.6 Insulated Piping: Comply with the following installation requirements.
- 3.3.6.1 Shields: Where low-compressive-strength insulation or vapor barriers are indicated, install coated protective shields. For pipe 8" and over, install wood insulation saddles.
- 3.3.6.2 Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ANSI B31.
- 3.4 Installation of Anchors:

- 3.4.1 Install anchors at proper locations to prevent stresses from exceeding those permitted by ANSI B31, and to prevent transfer of loading and stresses to connected equipment.
- 3.4.2 Fabricate and install anchors by welding steel shapes, plates and bars to piping and to structure. Comply with ANSI B31 and with AWS standards.
- 3.4.3 Anchor Spacings: Where not otherwise indicated, install anchors at ends of principal pipe-runs, at intermediate points in pipe-runs between expansion loops and elbows. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.
- 3.4.4 Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions to limit movement of piping and forces to maximums recommended by manufacturer for each unit.
- 3.5 Equipment Bases:
- 3.5.1 Concrete housekeeping bases will be provided as work of Division 3. Furnish to Contractor scaled layouts of all required bases, with dimensions of base, and location to column center lines. Furnish templates, anchor bolts, and accessories necessary for base construction.
- 3.5.2 Provide concrete housekeeping bases for all floor mounted equipment furnished as part of the work of Division 15. Size bases to extend minimum of 4" beyond equipment base in any direction; and 4" above finished floor elevation. Construct of reinforced concrete, roughen floor slab beneath base for bond, and provide steel rod anchors between floor and base. Locate anchor bolts using equipment manufacturer's templates. Chamfer top and edge corners.
- 3.5.3 Provide structural steel stands to support equipment not floor mounted or hung from structure. Construct of structural steel members or steel pipe and fittings. Provide factory-fabricated tank saddles for tanks mounted on steel stands. Prime and paint with black enamel.

END OF SECTION 15150

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## SECTION 15160 - MECHANICAL IDENTIFICATION

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 section making reference to or requiring identification devices specified herein.
- 1.3 Extent of mechanical identification work required by this section is indicated on drawings and/or specified in other Division-15 sections.
- 1.4 Refer to Division-16 sections for identification requirements of electrical work; not work of this section. Refer to other Division-15 sections for identification requirements for controls; not work of this section.
- 1.5 Codes and Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

### 2 PRODUCTS

- 2.1 General: Provide manufacturer's standard products of categories and types required for each application as referenced in other Division-15 sections. Where more than single type is specified for application, selection is Installer's option, but provide single selection for each product category.
- 2.2 Painted Identification Materials
  - 2.2.1 Stencils: Standard fiberboard stencils, prepared for required applications with letter sizes generally complying with recommendations of ANSI A13.1 for piping and similar applications, but not less than 1-1/4" high letters for ductwork and not less than 3/4" high letters for access door signs and similar operational instructions.
  - 2.2.2 Stencil Paint: Standard exterior type stenciling enamel; black, except as otherwise indicated; either brushing grade or pressurized spray-can form and grade.
  - 2.2.3 Identification Paint: Standard identification enamel.
- 2.3 Plastic Pipe Markers
  - 2.3.1 Pressure-Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers.
    - 2.3.1.1 Lettering: Manufacturer's standard pre-printed nomenclature which best describes piping system in each instance, as selected by Architect/Engineer in cases of variance with name as shown or specified.
    - 2.3.1.2 Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as separate unit of plastic.

2.4 Valve Tags:

2.4.1 Brass Valve Tags: Provide 19-gage polished brass valve tags with stamp-engraved piping system abbreviation in ¼" high letters and sequenced valve numbers ½" high, and with 5/32" hole for fastener. Provide 1-½" diameter tags, except as otherwise indicated.

2.4.2 Plastic Laminate Valve Tags: Provide manufacturer's standard 3/32" thick engraved plastic laminate valve tags, with piping system abbreviation in ¼" high letters and sequenced valve numbers ½" high, and with 5/32" hole for fastener. Provide 1-½" square black tags with white lettering, except as otherwise indicated.

2.5 Engraved Plastic-Laminate Signs:

2.5.1 General: Provide engraving stock melamine plastic laminate, in the sizes and thicknesses indicated, engraved with engraver's standard letter style a minimum of 3/4" tall and wording indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.

2.5.2 Thickness: 1/16" for units up to 20 sq. in. or 8" length; 1/8" for larger units.

2.5.3 Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

2.6 Stamped Nameplates: Provide equipment manufacturer's standard stamped nameplates for motors, AHUs, pumps, etc.

3 EXECUTION

3.1 Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.2 Ductwork Identification:

3.2.1 General: Identify air supply, return, exhaust, intake and relief ductwork with stenciled signs and arrows, showing ductwork service and direction of flow, in black or white.

3.2.2 Location: In each space where ductwork is exposed, or concealed only by removable ceiling system, locate signs near points where ductwork originates or continues into concealed enclosures, and at 50' spacings along exposed runs.

3.2.3 Access Doors: Provide stenciled signs on each access door in ductwork and housings, indicating purpose of access (to what equipment) and other maintenance and operating instructions, and appropriate and procedural information.

3.3 Piping System Identification:

3.3.1 General: Install pipe markers of one of the following types on each system indicated to receive identification, and include arrows to show normal direction of flow:

- 3.3.1.1 Plastic pipe markers.
- 3.3.1.2 Stenciled markers, black or white for best contrast.
- 3.3.2 Locate pipe markers as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces and exterior non-concealed locations.
  - 3.3.2.1 Near each valve and control device.
  - 3.3.2.2 Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.
  - 3.3.2.3 Near locations where pipes pass through walls, floors, ceilings, or enter non-accessible enclosures.
  - 3.3.2.4 At access doors, manholes and similar access points which permit view of concealed piping.
  - 3.3.2.5 Near major equipment items and other points of origination and termination.
  - 3.3.2.6 Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.
  - 3.3.2.7 On piping above removable acoustical ceilings, except omit intermediately spaced markers.
- 3.4 Valve Identification: Provide coded valve tag on every valve, cock and control device in each piping system; exclude check valves, valves within factory-fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibs, and shut-off valves at plumbing fixtures, HVAC terminal devices and similar rough-in connections of end-use fixtures and units. Coordinate code with operating instructions.
- 3.5 Valve Charts: Provide framed, glass covered valve charts in each mechanical room. Identify coded valve number, valve function, and valve location for each valve.
- 3.6 Mechanical Equipment Identification: Install engraved plastic laminate sign on a vertical surface on or near each major item of mechanical equipment and each operational device. Label shall indicate type of system and area served. Provide signs for the following general categories of equipment and operational devices:
  - 3.6.1 Main control and operating valves, including safety devices.
  - 3.6.2 Meters, gauges, thermometers and similar units.
  - 3.6.3 Fans, blowers, primary balancing dampers and VAV boxes.
  - 3.6.4 HVAC air handlers and fan coil units.
  - 3.6.5 Air conditioning indoor and outdoor units.
- 3.7 Stamped Nameplates: Equipment manufacturers to provide standard stamped nameplates on all major equipment items such as motors, pumps, AHUs, etc. Where motors are hidden from

view (within equipment casing, or otherwise not easily accessible, etc.), the equipment supplier shall furnish a duplicate motor data nameplate to be affixed to the equipment casing in an easily visible location, unless data is already included on the equipment nameplate.

3.8 Adjusting and Cleaning:

3.8.1 Adjusting: Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.

3.8.2 Cleaning: Clean face of identification devices, and glass frames of valve charts.

END OF SECTION 15160.

## SECTION 15170 - ACCESS DOORS

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 section making reference to or requiring access panels specified herein.
- 1.3 Approval Submittals:
- 1.3.1 Product Data: When required by other Division-15 sections, submit product data for access doors. Submit with Division-15 section using access doors, not as a separate submittal. Include rating data.
- 1.4 O&M Data Submittals: Submit a copy of approval submittal. Include this data in O&M Manuals.

### 2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide access doors by Acudor, Milcor, Jay R. Smith, Zurn, BOICO, Elmdor, or approved equal.
- 2.2 General: Where floors, walls and ceilings must be penetrated for access to mechanical work, provide types of access doors indicated. Furnish sizes indicated or, where not otherwise indicated, furnish adequate size for intended and necessary access. Furnish manufacturer's complete units, of type recommended for application in indicated substrate construction, in each case, complete with anchorages and hardware.
- 2.3 Access Door Construction: Except as otherwise indicated, fabricate wall/ceiling door units of welded steel construction with welds ground smooth; 16-gauge frames and 14-gauge flush panel doors; 175° swing with concealed spring hinges; flush screw-driver-operated cam locks; factory-applied rust-inhibitive prime-coat paint finish.

### 3 EXECUTION

- 3.1 Access doors shall be installed to operate and service all mechanical equipment including valves, dampers, duct access panels, and other items requiring maintenance that are concealed above or behind finished construction. Access doors shall be installed in walls, chase and floors as necessary, but are not required in accessible suspended ceiling systems. Access doors shall have factory applied protective phosphate coating and baked enamel primer suitable for field painting.
- 3.2 Access doors shall be installed by the Division installing the substrate construction. However, responsibility for furnishing and determining location of access doors is part of this Division's work. The style of access door shall be suitable for construction into which installed.
- 3.3 Access doors shall be sized and located as required to provide proper maintenance and service access in accordance with the manufacturer's recommendations and code authority requirements for all devices and equipment.

END OF SECTION 15170.

## SECTION 15180 - TESTING, CLEANING, AND STERILIZATION OF PIPING SYSTEMS

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 section making reference to or requiring the testing and other procedures specified herein.
- 1.3 Notify the Architect/Engineer when system tests are ready to be witnessed at least 24 hours prior to the test.
- 1.4 All materials, test equipment, and devices required for cleaning, testing, sterilizing or purging shall be provided by the Contractor.

### 2 PRESSURE TESTS

- 2.1 General: Provide temporary equipment for testing, including pump and gauges. Test piping systems before insulation is installed wherever feasible, and remove control devices before testing. Test each natural section of each piping system independently but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating. Fill each section with indicated medium and pressurize for indicated pressure and time.
- 2.2 Required test period is four hours.
- 2.3 No piping, fixtures, or equipment shall be concealed or covered until they have been tested. The contractor shall apply each test and ensure that it is satisfactory for the period specified before calling the Architect/Engineer to observe the test. Test shall be repeated upon request to the satisfaction of those making the inspection.
- 2.4 Observe each test section for leakage at the end of the test period. Test fails if leakage is observed or if pressure drop exceeds 5% of the test pressure.
- 2.5 Check of systems during application of test pressures should include visual check for water leakage and soap bubble or similar check for air and nitrogen leakage.
- 2.6 During heating and cooling cycles, linear expansion shall be checked at all elbows and expansion joints for proper clearance.
- 2.7 Repair piping systems sections which fail required piping test. Disassemble and re-install using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.
- 2.8 Pressure Test Requirements:
  - 2.8.1 Soil, Waste, and Vent Test all piping within the building with a 10 foot head of water. Test piping in sections so that all joints are tested. Provide test tees as required.

- 2.8.2 Domestic Water: Perform hydrostatic test on all piping within the building at twice the normal static pressure at service point, but not less than 100 psig. Once tested, flush out piping and leave under pressure of the supply main or 40 psig for the balance of the construction period.
- 2.8.3 Gas: Test with air or nitrogen at 150% of normal working pressure, but not less than 25 psig. The test and check for leaks shall be in accordance with NFPA-54.

### 3 CLEANING AND STERILIZATION

- 3.1 General: Clean exterior surfaces of installed piping systems of superfluous materials, and prepare for application of specified coatings (if any). Flush out piping systems with clean water or blowdown with air before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.
- 3.2 Flush and drain all water systems at least three times. Reverse flush systems from smallest piping to largest piping. Replace startup strainers with operating strainers.
- 3.3 Blowdown all gas systems with air or nitrogen (at a rate of flow exceeding design) at least three times or until no residue shows at each outlet. Reverse blowdown systems from smallest piping to largest piping.
- 3.4 Sterilization of Domestic Water Systems:
- 3.4.1 Prerequisites: All new hot and cold water piping installed (complete), all fixtures connected, system flushed out, and system filled with water.
- 3.4.2 The shut off valve at the point of connection shall be closed, all fixture outlets opened slightly, and a sterilizing solution shall be introduced at a manifold connection installed by the Contractor at the point of connection.
- 3.4.3 The solution shall contain 50 parts per million of available chlorine. The chlorinating material shall be either liquid chlorine or calcium hypochlorite. The solution shall be allowed to stand in the system for at least eight hours after which the entire system shall be flushed.
- 3.4.4 After final flushing, all aerators shall be removed, cleaned, and reinstalled. After final flush the residual chlorine shall not exceed 0.2 parts per million.
- 3.4.5 The Architect/Engineer shall be notified 24 hours prior to the procedure so that it can be witnessed.
- 3.4.6 Provide sampling and certified report by an independent testing lab. Provide written Health Department approval of disinfection samples.
- 3.5 Fuel Gas: Purge all fuel gas systems in accordance with NFPA 54.

END OF SECTION 15180

## SECTION 15190 - EXCAVATION AND BACKFILL

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 section making reference to or requiring excavation and backfill specified herein.
- 1.3 Refer to other Division-15 sections and/or drawings for specific requirements of the particular piping system being installed. Where another Division-15 section or the drawings conflict with requirements of this section, the other Division-15 section or the drawings shall take precedence over the general requirements herein.
- 1.4 OSHA: Contractor employee worker protection for all trenching and excavation operations shall comply with 29 CFR 1926.650 Subpart P and all current OSHA requirements.
- 1.5 Trench Safety Act: Contractor shall comply with all requirements of Florida Statutes Chapter 553, including the requirement to provide a separate line item to identify the cost to comply on a per lineal foot of trench and per square foot of shoring.

### 2 PRODUCTS

- 2.1 Sand: Clean, hard, uncoated grains free from organic matter or other deleterious substances. Sand for backfill shall be of a grade equal to mortar sand.
- 2.2 Gravel: Clean, well graded hard stone or gravel, free from organic material. Size range to be from No. 4 screen retentions to 1".
- 2.3 Earth: Fill free of clay, muck, stones, wood, roots or rubbish.
- 2.4 Identification Tape: Polyethylene 6 inches wide, 0.004 inches thick, continuously printed with "CAUTION" in large letters and type of pipe below.
- 2.5 Copper Identification Wire: 14-gauge.

### 3 EXECUTION

- 3.1 Ditching and Excavation: Shall be performed by hand wherever there is a possibility of encountering obstacles or any existing utility lines of any nature whatsoever. Where clear and unobstructed areas are to be excavated, appropriate machine excavation methods may be employed. Avoid use of machine excavators within the limits of the building lines.
- 3.2 Bedding: Excavate to bottom grade of pipe to be installed, and shape bed of undisturbed earth to contour of pipe for a width of at least 50% of pipe diameter. If earth conditions necessitate excavation below grade of the pipe, such as due to the presence of clay, muck, or roots, subcut and bring bed up to proper elevation with clean, new sand (as described in paragraph 2.1), deposited in 6" layers and tamped. Notify Architect/Engineer if subcut exceeds 12", or if bed is of an unstable nature. In this case a 6" minimum layer of gravel will be required before sand

bedding begins. Submit cost proposal if the earth conditions require subcut in excess of 12" or if gravel is required to achieve proper bedding.

- 3.3 Placing: Pipe shall be carefully handled into place. Avoid knocking loose soil from the banks of the trench into the pipe bed. Rig heavier sections with nylon slings in lieu of wire rope to avoid crushing or chipping. Pipe which is handled with insulation in place, coated pipe, and jacketed pipe shall have special handling slings as required to prevent damage to the material.
- 3.4 Backfilling: Deposit clean new sand (as described in paragraph 2.1) to 6" above the pipe and tamp. Then deposit sand or earth carefully in 6" layers, maintaining adequate side support, especially on nonferrous piping materials. Compact fill in 6" layers, using mechanical means, up to the top elevation of the pipe, and in 12" layers to rough or finish grade as required. Fine grade and restore surface to original condition.
- 3.5 Special: Excavations shall be installed and maintained in satisfactory condition during the progress of the work. Subsurface structures are to be constructed in adequately sized excavations. De-watering equipment shall be installed and properly maintained where required. Shoring shall be employed in the event of unstable soil condition, and in all cases where required by OSHA regulations and necessary to protect materials and personnel from injury.
- 3.6 Identification: Install identification tape directly above all underground piping, one tape for each pipe where multiple pipes are installed. Depth of tape shall be at least 6 inches below finished grade and 24" above buried pipe. Install copper wire above non-metallic pipes.
- 3.7 Depth of Cover: Minimum cover for underground piping is two feet unless indicated otherwise.

END OF SECTION 15190.

## SECTION 15205 - INSULATION FOR PLUMBING PIPE AND EQUIPMENT

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-15 Basic Mechanical Materials and Methods Sections apply to work of this section.
- 1.3 Approval Submittals:
  - 1.3.1 Product Data: Submit a producer's data sheets and installation instructions on each insulation system including insulation, coverings, adhesives, sealers, protective finishes, and other material recommended by the manufacturer for applications indicated. Submit for:  
  
Fiberglass pipe insulation
- 1.4 O&M Data Submittals: Submit a copy of all approval submittals. Include in O&M Manual.

### 2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide insulation products by Armstrong, Johns Manville, Knauf, Owens Corning, Pittsburgh Corning, U.S. Rubber, or approved equal. All products shall be asbestos-free.
- 2.2 Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics, and adhesive) with a flame-spread rating of 25 or less, and a smoke-developed rating of 50 or less, as tested by ANSI/ASTM E84.
- 2.3 Pipe Insulation Materials:
  - 2.3.1 Fiberglass Pipe Insulation: ASTM C547, Class 1 unless otherwise indicated. (Preformed sleeving with white all-service jacket, suitable for temperatures up to 450°F)
  - 2.3.2 Flexible Unicellular Pipe Insulation: ASTM C534, Type I. (Tubular, suitable for use to 200°F.)
  - 2.3.3 Staples, Bands, Wires, and Cement: As recommended by the insulation manufacturer for applications indicated.
  - 2.3.4 Adhesives, Sealers, Protective Finishes: Products recommended by the insulation manufacturer for the application indicated.
  - 2.3.5 Jackets: ASTM C921, Type I (vapor barrier) for piping below ambient temperature, Type II (vapor permeable) for piping above ambient temperature. Type I may be used for all piping at Installer's option.

### 3 EXECUTION

- 3.1 General:

- 3.1.1 Install thermal insulation products in accordance with manufacturer's written instructions, and in compliance with recognized industry practices to ensure that insulation serves intended purpose.
- 3.1.2 Install insulation materials with smooth and even surfaces and on clean and dry surfaces. Redo poorly fitted joints. Do not use mastic or joint sealer as filler for gapping joints and excessive voids resulting from poor workmanship.
- 3.1.3 Maintain integrity of vapor-barrier on insulation and protect it to prevent puncture and other damage. Label all insulation "ASBESTOS FREE".
- 3.1.4 Do not apply insulation to surfaces while they are hot or wet.
- 3.1.5 Do not install insulation until systems have been checked and found free of leaks. Surfaces shall be clean and dry before attempting to apply insulation. A professional insulator with adequate experience and ability shall install insulation.
- 3.1.6 Do not install insulation on pipe systems until acceptance tests have been completed except for flexible unicellular insulation. Do not install insulation until the building is "dried-in".
- 3.2 Fiberglass Pipe Insulation:
  - 3.2.1 Insulate the following piping systems (indoor locations):
    - 3.2.1.1 Domestic hot water, 141°-180° F: up to 1-1/4" pipe - 1½" thick, over 1-1/4" pipe 2" thick.
    - 3.2.1.2 Domestic hot water and hot water return, 105°-140° F: up to 3" pipe - 1½" thick, over 3" pipe - 2" thick.
  - 3.2.2 Apply insulation to pipe with all side and end joints butted tightly. Seal longitudinal lap by pressurizing with plastic sealing tool. Apply 3 inch wide self sealing butt strips to joints between insulation sections. Insulate all fittings, flanges, valves and strainers with premolded insulation. Apply coat of insulating cement to fittings and wrap with glass cloth overlapping each wrap 1" and adjacent pipe 2". Finish with heavy coat of general purpose mastic. Premolded PVC covers may also be used, but no flexible inserts are allowed.
  - 3.2.3 Provide hanger or pipe support shields of 16 gauge (minimum) galvanized steel over the insulation which extends halfway up the pipe insulation cover and at least 6" on each side of the hanger.
  - 3.2.4 Omit insulation on exposed plumbing fixture runouts from faces of wall or floor to fixture; on unions, flanges, strainer blowoffs, flexible connections and expansion joints.

END OF SECTION 15205.

## SECTION 15210 - INSULATION FOR HVAC EQUIPMENT AND PIPING

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-15 Basic Mechanical Materials and Methods Sections apply to work of this section.
- 1.3 Approval Submittals:
  - 1.3.1 Product Data: Submit producer's data sheets and installation instructions on each insulation system including insulation, coverings, adhesives, sealers, protective finishes, and other material recommended by the manufacturer for applications indicated. Submit for:  
  
Flexible unicellular piping insulation
- 1.4 O&M Data Submittals: Submit a copy of all approval submittals. Include in O&M Manual.

### 2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide insulation products by Armstrong, Johns Manville, Knauf, Owens Corning, Pittsburgh Corning, U.S. Rubber, or approved equal. All products shall be asbestos-free.
- 2.2 Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics, and adhesive) with a flame-spread rating of 25 or less, and a smoke-developed rating of 50 or less, as tested by ANSI/ASTM E84.
- 2.3 Pipe Insulation Materials:
  - 2.3.1 Flexible Unicellular Pipe Insulation: ASTM C534, Type I. (Tubular, suitable for use to 200°F.)
  - 2.3.2 Staples, Bands, Wires, and Cement: As recommended by the insulation manufacturer for applications indicated.
  - 2.3.3 Adhesives, Sealers, Protective Finishes: Products recommended by the insulation manufacturer for the application indicated.
  - 2.3.4 Jackets: ASTM C921, Type I (vapor barrier) for piping below ambient temperature, Type II (vapor permeable) for piping above ambient temperature. Type I may be used for all piping at Installer's option.

### 3 EXECUTION

- 3.1 General:

- 3.1.1 Install thermal insulation products in accordance with manufacturer's written instructions, and in compliance with recognized industry practices to ensure that insulation serves intended purpose.
- 3.1.2 Install insulation materials with smooth and even surfaces and on clean and dry surfaces. Redo poorly fitted joints. Do not use mastic or joint sealer as filler for gapping joints and excessive voids resulting from poor workmanship.
- 3.1.3 Maintain integrity of vapor-barrier on insulation and protect it to prevent puncture and other damage. Label all insulation "ASBESTOS FREE".
- 3.1.4 Do not apply insulation to surfaces while they are hot or wet.
- 3.1.5 Do not install insulation until systems have been checked and found free of leaks. Surfaces shall be clean and dry before attempting to apply insulation. A professional insulator with adequate experience and ability shall install insulation.
- 3.1.6 Do not install insulation on pipe systems until acceptance tests have been completed except for flexible unicellular insulation. Do not install insulation until the building is "dried-in".
- 3.2 Flexible Unicellular Pipe Insulation:
  - 3.2.1 Insulate the following piping systems:  
  
Condensate drains from air conditioning units - 1/2" thick.  
Refrigerant piping - 3/4" thick.
  - 3.2.2 Apply insulation in accordance with the manufacturer's recommendations and instructions. Mitre cut insulation to fit pipe fittings. Use approved cement to seal all joints and ends in the insulation.
  - 3.2.3 Insulation outside the building shall be protected by a smooth 0.016" thickness aluminum jacket secured with aluminum bands on 12" centers.

END OF SECTION 15210

## SECTION 15230 - EXTERIOR INSULATION FOR DUCTWORK

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-15 Basic Mechanical Materials and Methods sections apply to work of this section.

#### 1.3 Approval Submittals:

- 1.3.1 Product Data: Submit producer's data sheets and installation instructions on each insulation system including insulation, coverings, adhesives, sealers, protective finishes, and other material recommended by the manufacturer for applications indicated. Submit for:

Flexible duct insulation

- 1.4 O&M Data Submittals: Submit a copy of all approval submittals. Include in O&M Manual.

### 2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide insulation products by Knauf, Owens-Corning, Johns Manville, Certainteed.
- 2.2 Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, coverings, sealers, mastic, and adhesive) with a flame spread rating of 25 or less, and a smoke-developed rating of 50 or less as tested by ANSI/ASTM 84.
- 2.3 Flexible Fiberglass Insulation: ASTM C553, Type I, Class B-3 (temperature less than 350°F). Duct wrap shall be 1 pcf density with UL rated aluminum foil vapor barrier (FSK).
- 2.4 General Purpose Mastic: Benjamin Foster 35-00 Series, Insulcoustic VIAC Mastic, Childers CP-10, or approved equal. The final selection of this product for the specific application indicated is the responsibility of the insulation supplier. The insulation system must meet the specified application.
- 2.5 Vapor Barrier Sealant: Benjamin Foster 30-35, Insulcoustic IC-501, 3M EC-1378, Childers CP-30, or approved equal. Provide "Low Odor" type. The final selection of this product for the specific application indicated is the responsibility of the insulation supplier. The insulation system must meet the specified application.
- 2.6 Adhesive: Benjamin Foster 85-20, Insulcoustic IC-205, 3M EC-35, Childers CP-82, Childers CP-89, or approved equal. The final selection of this product for the specific application indicated is the responsibility of the insulation supplier. The insulation system must meet the specified application.
- 2.7 Fiber-Glas Mesh: 10x10 Mesh. Foster Mastafab or equal.

### 3 EXECUTION

- 3.1 Insulate all supply, return and outdoor air ductwork concealed above ceilings, in chases, or elsewhere, and the backs of all ceiling supply outlets with 2" thick fiberglass blanket insulation with vapor barrier.
- 3.2 Installation of Flexible Insulation: Insulate all supply, return and outdoor air ductwork and the backs of all ceiling supply outlets with 2" thick fiberglass blanket insulation with vapor barrier.
  - 3.2.1 Insulate round elbows and fittings with wrap such that thickness is equal to adjoining duct covering. Clean and dry ductwork prior to insulating.
  - 3.2.2 Adhere insulation to duct with 50 percent coverage using approved insulation adhesive applied in 6-inch wide swaths with 6-inch spaces between swaths. Additionally secure insulation with perforated pins and Tuff-Bond or by self-sticking pins with a 3/8" self-tapping screw. Space on 12-inch centers and 3 inches from all edges. Ducts up through 24" wide only require one row of pins. Ducts over 24" wide shall have pins spaced as described herein.
  - 3.2.3 Lap all joints 2 inches and seal joints with 4-inch wide strips of open mesh glass fabric embedded in two coats of general purpose mastic.
  - 3.2.4 Seal all punctures and breaks in aluminum vapor barrier with open mesh glass fabric and vapor barrier sealant.

END OF SECTION 15230.

## SECTION 15370 - CLEAN AGENT FIRE EXTINGUISHING SYSTEM

### 1 GENERAL

- 1.1 Drawings and General provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-15 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of clean agent system work is indicated on drawings and schedules, and by requirements of this section. The work includes all panels, detectors, wiring, conduits, and devices for a complete and operational system.
  - 1.3.1 The system shall be a fixed installation, total flooding type using a clean agent to protect the following hazards.. Refer to the drawings for additional details.
  - 1.3.2 Interface system with the building fire alarm system.
- 1.4 Refer to Division-16 sections for the following work; not work of this section: Power supply wiring from power source to power connection or control panels, disconnects and required electrical devices, except where specified as furnished or factory-installed by manufacturer.
  - 1.4.1 Building fire alarm connections from all control panels.
- 1.5 Codes and Standards:
  - 1.5.1 NFPA Compliance: Install systems in accordance with NFPA 2001 "Clean Agent Fire Extinguishing Systems".
  - 1.5.2 UL Compliance: Provide fire protection products in accordance with UL standards; provide UL label on each product.
  - 1.5.3 Fire Department/Marshal Compliance: Install fire protection systems in accordance with local regulations of fire department or fire marshal.
  - 1.5.4 Provide systems complying with NFPA 70 "National Electric Code", NFPA 71 "Central Station Signal Systems", NFPA 72A "Local Protective Signaling Systems", NFPA 72E "Automatic Fire Detectors", NFPA 72G "Notification Appliances for Protective Signaling Systems", NFPA 72H "Test Procedures for Signaling Systems", and NFPA 77 "Recommended Practice on Static Electricity".
  - 1.5.5 Provide systems complying with NFPA 101 "Life Safety Code".
  - 1.5.6 Provide systems complying with NFPA 75 "Electronic Computer Systems".
- 1.6 Approval Submittals:
  - 1.6.1 Product Data: Submit manufacturer's technical product data and installation instructions for:

Storage cylinders  
Control valves and pilot controls  
Control panels  
Nozzles  
Manual pull stations  
Detectors  
Alarm bells or horns  
Abort switches  
Annunciators

- 1.6.2 Working (Shop) Drawings: Prepare working (shop) drawings of fire protection systems indicating storage units, nozzles, pipe sizes, pipe locations, fittings, shutoffs, equipment, etc. P.E. seal not required.
- 1.6.3 Working (Shop) Drawings: Prepare working (shop) drawings for detection systems indicating complete system wiring diagrams and single line drawings for all components of the system. Wiring diagrams shall show all conductors required, size and type. Data shall include manufacturer's recommended procedure for testing all alarm devices. Provide sequence of operation. P.E. seal not required.
- 1.6.4 Approval Calculations: For total flood hazards, submit design calculations derived from computer program written specifically for the proprietary system used. The analysis shall include calculations to verify system terminal pressures, nozzle flow rates, orifice code number, piping pressure losses, component flow data, and pipe sizes considering actual and equivalent lengths of pipe and elevation changes. P.E. seal is not required.
- 1.7 Test Reports and Verification Submittals:
- 1.7.1 Certificate of Installation: Submit certificate upon completion of fire protection piping work which indicates that work has been tested in accordance with NFPA 2001, and also that system is operational, complete, and has no defects.
- 1.7.2 Discharge Test Report: Submit results of discharge test including the results of all air sampling.
- 1.7.3 Door Fan Test Report: Submit results of door fan test including leakage calculations.
- 1.8 O&M Data Submittals:
- 1.8.1 Record Drawings: At project closeout, submit record drawings of installed fire protection piping and products.
- 1.8.2 Maintenance Data: Submit a copy of all approval submittals. Submit maintenance data, and parts lists for control valves and pilot controls, control panels, detectors, manual pull stations, alarm bells or horns, abort switches, annunciators. Include these data with approval calculations in O&M Manual.
- 1.8.3 Wiring Diagrams: Submit manufacturer's electrical requirements for all control, detector, alarm, test and indication functions. Include interface with fire alarm systems, door closers, HVAC shutdowns, power shutdowns, and related systems. Submit point-to-point wiring

diagrams and manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed. Include in O&M Manual.

## 2 PRODUCTS:

2.1 General: Provide manufacturer's standard materials and equipment to perform the functions indicated. Locks for all cabinets and manual stations shall be keyed alike. All devices and equipment shall be UL listed.

2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products by Fenwal Inc., Fike, Chemetron or Pyrotronics.

2.3 Scope: This section includes requirements for all equipment, materials and labor necessary for a complete and operating automatic fire detection and clean agent extinguishing system in accordance with NFPA 2001 and as specified herein and indicated on the drawings. In addition, provide necessary interface controls to HVAC systems, door closures, equipment shutdowns, and building fire alarm system as required.

## 2.4 Cylinders:

2.4.1 Cylinder assemblies shall be capacity shown on the drawings and shall conform to the regulations of the Department of Transportation.

2.4.2 Cylinders shall be fitted with a resilient pressure seat type forged brass valve and shall have a threaded steel anti-recoil protective cap for handling and shipment.

2.4.3 The cylinders shall be mounted in free standing steel racks or on solid walls. The cylinders and racks shall be arranged to allow a service aisle for cylinder removal and cylinder weighing. Provide liquid level indicators on cylinders.

2.4.4 Reserve Bank: Provide for a reserve bank of cylinders to store an equal amount of clean agent required for suppression in a separate vessel. Provide manually operated transfer switch to transfer the pilot cylinder electric actuation from the main cylinders to the reserve cylinders.

## 2.5 Discharge Valves:

2.5.1 Each cylinder shall be fitted with a pressure operated discharge valve. Each valve shall include an integral safety relief device which serves to protect cylinder against excessive internal pressure.

2.5.2 The cylinder valve shall have a forged brass body with external connections for actuation devices. Each valve shall be provided with a removable pressure gauge or solenoid valve with gauge for pressure reading.

2.5.3 When more than one cylinder is connected to a common manifold, a check valve shall be provided with each cylinder. Check valves that utilize "O" ring seats shall not be used as they can be dislodged during discharge.

2.5.4 Selector Valve Systems: The protection for hazards shall be from the same bank of cylinders. Selector valves shall be used. The selector valves shall be pressure operated and self restoring.

They shall be released by pilot operators which can be operated directly, by remote pressure source and/or by electric solenoid.

2.6 Control Panel:

2.6.1 The control panel shall communicate with and control the following types of equipment used to make up the system: Intelligent smoke detectors, addressable modules, manual release/abort stations, alarm indicating appliances, releasing components and other system controlled devices.

2.6.2 Display:

2.6.2.1 Provide all the controls and indicators used by the system operator.

2.6.2.2 Provide the status indication of the following system parameters: AC POWER, SYSTEM ALARM, SYSTEM TROUBLE, SIGNAL SILENCED, SUPERVISORY, and PRE-ALARM.

2.6.2.3 Provide a touch key-pad with control capability to command all system functions, entry of any alphabetic or numeric information, and field programming.

2.6.2.4 Provide the following operator functions: SIGNAL SILENCE, RESET, DRILL, and ACKNOWLEDGE.

2.6.3 Power Supply:

2.6.3.1 The power supply shall be power limited and shall operate on 120 VAC, 60 Hz.

2.6.3.2 Provide a battery charger for 24 hours of standby using dual-rate charging techniques for fast battery recharge.

2.6.3.3 Provide for detecting ground faults.

2.6.3.4 Provide optional meters to indicate battery voltage and charging current.

2.6.4 Field Wiring Terminal Blocks: For ease of service, all wiring terminal blocks for I/O interfaces shall be the plug-in type and have sufficient capacity for 18 to 12 AWG wire. Terminal blocks permanently fixed or mounted are not acceptable.

2.6.5 Operator Controls:

2.6.5.1 Provide alarm acknowledge switch to acknowledge and silence alarms.

2.6.5.2 Provide system reset switch(es).

2.6.5.3 Provide drill (evacuate) switch.

2.6.5.4 Provide for field programming.

2.6.5.5 Provide for smoke detector sensitivity adjustment.

2.6.5.6 Provide for alarm verification.

- 2.6.5.7 Provide for point disable.
- 2.6.5.8 Provide for reading or displaying of all point status.
- 2.6.5.9 Provide for automatic detector maintenance alert.
- 2.6.5.10 Provide for pre-alarm function.
- 2.6.5.11 Provide for zoned control.
- 2.6.6 System Operation:
  - 2.6.6.1 Heat Detector Operation: The system shall be released automatically by actuation of cross-zoned rate compensated detector(s) located in the hazard in accordance with the detector rating and applicable detection system standards. Closing of the normally open switch element of the detector will signal the control panel.
  - 2.6.6.2 Smoke Detector Operation: The system shall be released automatically by cross-zoned photoelectric ionization type smoke detectors located in the hazard in accordance with detector ratings, good practice and applicable detection system standards. Operation of smoke detector will signal the control panel.
  - 2.6.7 Completion of Time Delay: On completion of the time delay the system shall cause the following to occur.
    - 2.6.7.1 Initiate the discharge alarm.
    - 2.6.7.2 Initiate the external visual (strobe) alarm.
    - 2.6.7.3 Discharge the clean agent.
- 2.7 System Devices:
  - 2.7.1 Electronic Sounders:
    - 2.7.1.1 Electronic sounders shall operate on 24 VDC nominal.
    - 2.7.1.2 Electronic sounders shall provide continuous or interrupted tones with an output sound level of at least 90 dBA measured at 10 feet from the device.
  - 2.7.2 Strobe Lights: Provide strobe lights that meet the requirements of ADA as defined in UL 19781 and the following criteria:
    - 2.7.2.1 The maximum pulse duration shall be 2/10ths of the one second.
    - 2.7.2.2 Unless otherwise specified on the drawings, the intensity shall be a minimum of 75 candela.
    - 2.7.2.3 The flash rate shall be a minimum of 1 Hz and a maximum of 3 Hz.
  - 2.7.3 Non-Coded Manual Fire Alarm Stations:

- 2.7.3.1 Manual fire alarm stations shall be non-code, non-breakglass type, equipped with key lock in order that they may be tested without operating the handle.
- 2.7.3.2 Stations shall be designed so that after an actual activation, they cannot be restored to normal except by key reset.
- 2.8 Discharge Nozzles:
  - 2.8.1 Nozzles shall be supplied in quantities sufficient to properly cover the area(s) being protected in accordance with NFPA 2001.
  - 2.8.2 Nozzles shall be of corrosion resistant construction and shall be designed specifically for clean agent application.
  - 2.8.3 Nozzles shall be permanently marked as to type and orifice.
- 2.9 Agent:
  - 2.9.1 The fire suppression agent shall be an approved type; a clean, dry, non-corrosive, non-damaging, non-deteriorating gas meeting the requirements of NFPA 2001.
  - 2.9.2 The agent shall be suitable for use in normally occupied spaces.
  - 2.9.3 The agent shall be stored in a container super pressurized with nitrogen to a maximum working pressure of 360 psia. Higher pressure agents are unacceptable.
  - 2.9.4 Agent shall be listed as "Acceptable" on the EPA's SNAP list.
- 2.10 Maintenance Service: In addition to the normal contractual warranty requirement, provide the first year's maintenance and service to include the following as a minimum.
  - 2.10.1 Inspect the system 6 months and 12 months after substantial completion.
  - 2.10.2 At each inspection, determine agent contents and pressure, and that system is in proper working order. Include complete checkout of control, detection, and alarm systems.
  - 2.10.3 Submit documents certifying satisfactory system conditions. Include manufacturer's certificate of acceptance of qualifications of Inspector.
- 2.11 Pipes and Pipe Fittings: provide pipes and pipe fittings complying with Division-15 Basic Mechanical Materials section "Pipes and Pipe Fittings", in accordance with the following:
  - 2.11.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in fire protection systems.
  - 2.11.2 Discharge Pipe: Schedule 40 black or galvanized steel, ASTM A53, seamless.

- 2.11.3 Discharge Pipe Fittings: Screwed, galvanized malleable or ductile iron, 300 lb. Class, or welded. Reduce pipe size by one of the following methods.
- 2.11.3.1 Screwed concentric fittings.
- 2.11.3.2 Swaged nipples.
- 2.11.3.3 Butt-weld concentric reducers.
- 2.11.3.4 Weld-o-lets.
- 2.11.4 Pilot Network Pipe and Fittings:
- 2.11.4.1 Threaded Pipe: Provide ¼" Schedule 40 black or galvanized steel pipe with 300 lb. malleable or ductile iron fittings. Treat all pipe connections with a suitable sealant. Teflon tape is not allowed.
- 2.11.4.2 Pressure Release Pipe and Fittings: Provide pressure release pipe and fittings of same material as discharge pipe and fittings. All takeoffs from pressure release piping shall be from the top of the discharge piping.
- 2.12 Basic Identification: Provide identification complying with Division-15 Basic Mechanical Materials and Methods section "Mechanical Identification", in accordance with the following listing:
- Fire Protection Piping: Plastic pipe markers.
- Fire Protection Valves: Plastic or brass valve tags.
- Fire Protection Signs: Provide the following signs:
- At each valve and storage container, sign indicating what portion of system valve controls or tank serves.
- At each alarm device, sign indicating what authority to call if device is activated.
- 2.13 Basic Piping Specialties: Provide piping specialties complying with Division-15 Basic Mechanical Materials and Methods section "Piping Specialties".
- 2.14 Basic Support and Anchors: Provide support and anchors complying with Division-15 Basic Mechanical Materials and Methods section "Supports and Anchors". All pipe hangers and supports shall conform to the provisions outlined in ANSI B31.1, latest edition, except as modified and supplemented by this specification. All pipe must be solidly anchored to structural members where longitudinal or lateral movement is possible.
- 2.14.1 Provide rigid hangers wherever a change in direction or change in elevation in the piping system occurs. On long straight runs, at least every other hanger shall be rigid.
- 2.14.2 Provide support systems using Unistrut.

2.14.3 All piping shall be attached to rigid hangers by means of U-bolts locked with double nuts, one on each side of hanger. The pipe shall be free to move longitudinally within the U-bolt except where the piping design requires it to be anchored.

2.15 Conduit and Wiring: Provide conduit and wiring complying with the National Electric Code and the requirements of Division 16.

### 3 EXECUTION

3.1 General: Examine areas and conditions under which clean agent system materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 Installation of Basic Identification: Install mechanical identification in accordance with Division-15 Basic Mechanical Materials and Methods section "Mechanical Identification". Install signs on piping in accordance with NFPA 2001 requirements.

#### 3.3 Installation of Pipes and Pipe Fittings:

3.3.1 General: Install pipes and pipe fittings in accordance with Division-15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings".

3.3.2 Comply with requirements of NFPA 2001 for installation of clean agent system piping materials. Install piping products where indicated, in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that piping systems comply with requirements and serve intended purposes.

3.3.3 Size: Size all piping in accordance with NFPA 2001 by means of hydraulic calculations to deliver the required rate of flow at each nozzle.

3.3.4 Piping runs shall be closely coordinated with all other trades prior to installation to prevent conflicts. If conflicts do occur they shall be resolved in the field at no additional cost to the Owner (no change in contract price).

3.3.5 Installation shall be performed in a workmanlike manner.

3.3.6 All pipe shall be reamed after cutting so that all burrs and sharp edges are removed.

3.3.7 All pipe must be thoroughly cleaned before installation. A wire flue brush shall be pulled through the length several times, followed by clean cloth rags treated with a noncombustible metal cleaner designed for the purpose. All foreign matter and oil must be removed by this process.

3.3.8 All pipe and fittings installed outside or in corrosive areas must be galvanized or treated with a proper protective coating.

3.3.9 Thread Penetration: All screwed discharge and pressure release pipe shall be coated with Telfon tape or an appropriate pipe joint compound. When tape or pipe joint compound is used, coating of the threads must start at least two threads back from the pipe end. On small piping, care must be taken so as not to allow sealant to enter valves or controls.

- 3.3.10 Bushings are not allowed.
- 3.4 Installation of Piping Specialties: Install piping specialties in accordance with Division-15 Basic Mechanical Materials and Methods section "Piping Specialties".
- 3.5 Installation of Supports and Anchors: Install supports and anchors, in accordance with Division-15 Basic Mechanical Materials and Methods section, "Supports and Anchors", except as modified as follows.
  - 3.5.1 Hangers and pipe shall be designed to prevent stresses from being induced into the pipe during the temperature change caused by the FM-200 system discharge.
  - 3.5.2 All piping supports shall be fabricated and installed so that they will not be disengaged by the movement of supported pipe.
  - 3.5.3 Pipe shall not be hung using one pipeline as a support for another.
  - 3.5.4 Piping supports shall be arranged so that no excessive bending stresses are induced into the piping from concentrated loads between supports.
  - 3.5.5 Provide pipe supports for the maximum spacing for either screwed or welded pipe as listed below.

Nominal Pipe Size (Inches)	Maximum Span (Feet)
1/4.....	5
1/2.....	5
3/4.....	6
1.....	7
1 1/4.....	8
1 1/2.....	9
2.....	10
2 1/2.....	11
3.....	12
4.....	14

- 3.6 Valve and Equipment Connections: Threaded valves such as selector valves, check valves, and solenoid valves shall be installed with a union immediately downstream. Valves having more than two connection points such as shuttle valves and pilot valves shall be installed with a union adjacent to the valve in each connection line. Pipe connections to equipment items such as discharge delay devices, pressure switches, etc., shall have a union adjacent to the equipment.
- 3.7 Storage Containers:
  - 3.7.1 Modular Storage System: Storage containers shall be rigidly affixed to mounting brackets designed for the intended use. Brackets shall be made of steel and be bolted to the fire area boundary walls or building columns in accordance with manufacturer's recommendations.

- 3.7.2 Location: Mount containers where shown, as close as possible to the protected area to minimize distribution piping.
- 3.8 Nozzles: Install in accordance with manufacturer's recommendations. Nozzles located in the suspended ceiling shall not interfere with lights, duct diffusers, ceiling grids or other ceiling devices. Ceiling tile penetrations shall be covered by a chrome plated escutcheon plate. Nozzle locations subject to approval.
- 3.9 Wiring:
- 3.9.1 General: Provide all required wiring in accordance with the manufacturer's printed instructions, Division-16 requirements, and National Electric Code.
- 3.9.2 Conduit: Install wiring in EMT or rigid conduit except where necessary for movement of components.
- 3.9.3 Conductors: Provide sizes specified by the manufacturer. Color code wire and tag at all junction points.
- 3.9.4 Make final connections under supervision of the manufacturer's factory-trained representative.
- 3.10 Devices:
- 3.10.1 Control Panels: Flush or surface mount as indicated. Make up all wiring and test to insure proper operation.
- 3.10.2 Manual Stations: Mount semi-flush in walls except where shown to be surface mounted in unfinished spaces. Mount 48" above floor.
- 3.10.3 Automatic Devices: Mount on 4 inch outlet box and make up pre-wired connector. Devices shall generally be flush in ceiling except that they shall be surface mounted where located above ceilings, below accessible flooring and in unfinished spaces. Conduct tests to demonstrate proper operation.
- 3.10.4 Remote Annunciators: Flush mount in wall except where shown to be surface mounted. Make up all connections and test to demonstrate proper operation.
- 3.10.5 Alarms: Alarms in unfinished spaces shall be surface mounted. In finished spaces, alarms shall be recessed in walls or ceiling as indicated. Provide suitable back box and cover grille.
- 3.11 System Inspection and Checkout:
- 3.11.1 After the installation is complete the system shall be inspected by factory trained personnel in accordance with the manufacturer's recommended procedures.
- 3.11.2 All wiring shall be tested for proper connection, continuity and resistance to ground.
- 3.11.3 The complete system shall be functionally tested in the presence of the Owner and Engineer and all functions including system and equipment interlocks must be operational at least 10 days prior to the final acceptance test. The following shall be tested at a minimum.

- 3.11.3.1 Close each supervisory contact and verify proper supervisory alarm at the control panel.
- 3.11.3.2 Open initiating device circuits and verify that the trouble signal actuates.
- 3.11.3.3 Open and short indicating appliance circuits and verify that trouble signal actuates.
- 3.11.3.4 Ground device circuits and verify response of trouble signals.
- 3.11.3.5 Open release circuits and verify response of trouble signals.
- 3.11.3.6 Check presence and audibility of tone at all alarm notification devices.
- 3.11.4 Each detector shall be tested in accordance with the manufacturer's recommended procedures. The system and equipment interlocks such as door releases, audible and visual alarms and equipment shutdowns shall function at that time.
- 3.11.5 Each initiating device circuit shall be tested for its alarm reporting capability by operating all of the connected initiating devices.
- 3.12 Training:
  - 3.12.1 Prior to final acceptance, the contractor shall provide operation training to the Owner's personnel. The training session shall include emergency procedures, abort functions, system control panel operation, trouble procedures and safety requirements. The session shall include a complete demonstration of the system. Dates and times of the training period shall be coordinated through the Architect/Engineer not less than two weeks prior to session.
  - 3.12.2 Training sessions shall include a review of operational and maintenance manuals and as-built drawings.
  - 3.12.3 Provide 10 day prior notice of discharge test to Architect/Engineer.
  - 3.12.4 Demonstrate the entire control system functions as intended. All circuits shall be tested: automatic and manual discharge, equipment shutdown and door closure, alarm devices and container pressure, and all supervision.
  - 3.12.5 Concentration measurements shall be obtained at a height no higher than the highest hazard. Record all measurements.
  - 3.12.6 If design concentration is not achieved and/or held for the soak time, contractor shall correct cause and repeat test at no charge to the Owner.
  - 3.12.7 Upon completion of a satisfactory test, the system shall be reset, reconditioned, and refilled with clean agent and placed in operation within 24 hours.
  - 3.12.8 Submit test report including a recording of all concentrations.
- 3.13 Diagrams and Instructions: Provide neatly typed instructions outlining standard procedures to be followed in the event of a trouble condition or a fire alarm. Mount in frame at control panel

location. Provide plan drawings (1/8" = 1'-0") showing location of automatic detectors and manual stations and clearly identifying each fire area. Secure to wall adjacent to control panel.

END OF SECTION

## SECTION 15405 - POTABLE WATER SYSTEM

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-15 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of potable water systems work, is indicated on drawings and schedules, and by requirements of this section.
- 1.4 Refer to appropriate Division-2 sections for exterior potable water system; not work of this section unless noted.
- 1.5 Insulation for potable water piping is specified in other Division-15 sections, and is included as work of this section. Insulation requirements include:  
Domestic hot water piping  
Cold water piping outside of the building envelope.
- 1.6 Excavation and backfill required in conjunction with water piping is specified in other Division-15 sections, and is included as work of this section.
- 1.7 Code Compliance: Comply with applicable portions of Florida Building Code-Plumbing pertaining to selection and installation of plumbing materials and products. Comply with local utility requirements.
- 1.8 Approval Submittals:
- 1.8.1 Product Data: Submit manufacturer's technical product data and installation instructions for:  
Valves  
Strainers  
Hose bibbs  
Wall hydrants  
Water hammer arresters  
Meters and gauges  
Relief valves  
Trap primers  
Access doors
- 1.9 Test Reports and Verification Submittals:
- 1.9.1 Disinfection: Submit report by Health Department.
- 1.10 O&M Data Submittals: Submit a copy of all approval submittals. Submit maintenance data and parts lists for valves, trap primers. Include these data in O&M manual.

## 2 PRODUCTS

- 2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with Florida Building Code-Plumbing where applicable. Provide sizes and types matching pipe materials used in potable water systems. Where more than one type of materials or products is indicated, selection is Installer's option.
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following listed for each item.
- 2.3 Identification: Provide identification complying with Division-15 Basic Mechanical Materials and Methods section "Mechanical Identification". Provide manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct burial service; not less than 6" wide x 4 mils thick. Provide blue tape with black printing reading "CAUTION WATER LINE BURIED BELOW".
- 2.4 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:
- 2.4.1 Interior Water Piping:
- 2.4.1.1 Above Grade: Copper tube; Type L, hard-drawn temper; wrought-copper fittings, solder-joints.
- 2.4.2 Solder joints shall be made with 95-5 solder.
- 2.5 Piping Specialties: Provide piping specialties complying with Division-15 Basic Mechanical Materials and Methods section "Piping Specialties".
- 2.6 Supports and Anchors: Provide supports and anchors complying with Division-15 Basic Mechanical Materials and Methods section "Supports and Anchors".
- 2.7 Interior Valves: Provide valves complying with Division-15 Basic Mechanical Materials and Methods section "Valves", in accordance with the following listing:
- 2.7.1 Sectional and Shutoff Valves: GA1, GA2, GA3, BA1, BA2.
- 2.7.2 Drain Valves: GA1, GA2, BA1, BA2.
- 2.7.3 Throttling Valves: BA1, BA2.
- 2.7.4 Check Valves: CK1, CK2, CK3.
- 2.8 Exterior Valves: Provide as indicated, gate valves, AWWA C500, 175 psi working pressure. Provide threaded, flanged, hub, or other end configurations to suit size of valve and piping connections. Provide inside screw type for use with curb valve box, iron body, bronze-mounted, double disc, parallel seat, non-rising stem. Clow Corp., Dresser Mfg., Fairbanks Co., Kennedy, Stockham.

- 2.9 Hose Bibbs: Provide rough nickel plated hose bibbs with lock shield compression stop and removable handle, solid flange, female connection with ¾" male threaded hose end, and straight line type non-removable vacuum breaker with ¾" male threaded hose end. Acorn 8121 RCP or equal model by Woodford.
- 2.10 Wall Hydrants: Provide complete bronze body hose bibbs inside stainless steel box with hinged access door with cylinder lock and "WATER" stamped on cover. Provide key operated control valve with all bronze interior parts, replaceable seat washer, screwdriver operated stop valve in supply, and ¾" male threaded hose connection. Zurn Z1350 or equal by Acorn or Woodford.
- 2.11 Water Hammer Arresters: Provide bellows type water hammer arresters, stainless steel casing and bellows, pressure rated for 250 psi, tested and certified in accordance with PDI Standard WH-201. Precision Plumbing Products, Josam, Zurn, Amtrol, Wade, Jay R. Smith, or approved equal.
- 2.12 Meters and Gauges: Provide meters and gauges complying with Division-15 Basic Mechanical Materials and Methods section "Meters and Gauges", in accordance with the following listing:
- Thermometers  
Pressure gauges  
Calibrated balancing cocks
- 2.13 Combined Pressure-Temperature Relief Valves: Provide relief valves as indicated, of size and capacity as selected by Installer for proper relieving capacity, in accordance with ASME Boiler and Pressure Vessel Code. Provide bronze body, test lever and thermostat complying with ANSI Z21.22 listing requirements for temperature discharge capacity. Provide temperature relief at 210°F, and pressure relief at 150 psi. Watts, Cash, Zurn, or approved equal.
- 2.14 Trap Primers: Provide brass trap primers and distribution units to seal floor drains indicated on drawings. Trap primer valves shall be automatic, self contained type with no springs or diaphragms and shall not require adjustment. Trap primer valves shall be the type that can be installed anywhere on cold water piping. Distribution units shall supply 1-4 floor drains. Trap primer valves shall comply with ASSE 1018. Precision Plumbing Products PR-500, or approved equal. Where P-trap primers are indicated use "Prime-Eze" by Jay R. Smith, or approved equal.
- 2.15 Access Doors: Provide access doors to service all valves and other devices as required in accordance with Division-15 Basic Materials and Methods Section "Access Doors".

### 3 EXECUTION

- 3.1 General: Examine areas and conditions under which potable water systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- 3.2 Install mechanical identification in accordance with Division-15 Basic Mechanical Materials and Methods section "Mechanical Identification".

- 3.3 Install water distribution piping in accordance with Division-15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings".
- 3.3.1 Install piping with 1/32" per foot (¼%) downward slope towards drain point.
- 3.3.2 Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.
- 3.4 Install piping specialties in accordance with Division-15 Basic Mechanical Materials and Methods section "Piping Specialties".
- 3.5 Install supports and anchors in accordance with Division-15 Basic Mechanical Materials and Methods section "Supports and Anchors".
- 3.6 Install valves in accordance with Division-15 Basic Mechanical Materials and Methods section "Valves".
- 3.6.1 Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves two or more plumbing fixtures or equipment connections, and elsewhere as indicated.
- 3.6.2 Shutoff Valves: Install on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and elsewhere as indicated.
- 3.6.3 Drain Valves: Install on each plumbing equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere where indicated or required to completely drain potable water system.
- 3.6.4 Check Valves: Install where indicated.
- 3.6.5 Calibrated Balancing Cocks: Install in each hot water recirculating loop, and elsewhere as indicated.
- 3.7 Hose Bibbs and Wall Hydrants: Install on concealed piping where indicated with vacuum breaker. Mount 18 inches above grade or finished floor.
- 3.8 Install meters and gauges in accordance with Division-15 Basic Mechanical Materials and Methods section "Meters and Gauges".
- 3.9 Install relief valves on each water heater, and where indicated in accordance with the manufacturer's instructions. Pipe full size outside or to floor drain. Cut the end of the pipe at a 45° angle and terminate 6 inches above the floor or grade.
- 3.10 Piping Runouts to Fixtures: Provide hot and cold water piping runouts to fixtures of sizes indicated, but in no case smaller than required by Florida Building Code-Plumbing.
- 3.11 Install water hammer arresters in upright position, in locations and of sizes indicated in accordance with PDI Standard WH-201.
- 3.12 Install trap primers as indicated, and in accordance with manufacturer's installation instructions. Provide access panels to all trap primers unless accessible through a lay-in ceiling.

- 3.13 Locate and coordinate installation of access doors for all valves and devices in accordance with Division-15 Basic Mechanical Materials and Methods section "Access Doors".
- 3.14 Piping Tests: Test, clean, and sterilize potable water piping in accordance with testing requirements of Division-15 Basic Mechanical Materials and Methods section "Testing, Cleaning, and Sterilization of Piping Systems".

END OF SECTION 15405.

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## SECTION 15410 - SOIL, WASTE AND VENT SYSTEM

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-15 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of soil waste and vent systems work is indicated on drawings and schedules, and by requirements of this section.
- 1.4 Refer to appropriate Division-2 sections for exterior sanitary sewer system required in conjunction with soil and waste systems; not work of this section.
- 1.5 Excavation and backfill required in conjunction with soil, waste and vent piping is specified in other Division-15 sections and is included as work of this section.
- 1.6 Refer to Division-7 section "Flashing and Sheet Metal" for flashings required in conjunction with soil and waste systems; not work of this section.
- 1.7 Code Compliance: Comply with applicable portions of Florida Building Code-Plumbing pertaining to plumbing materials, construction and installation of products. Comply with local utility requirements.
- 1.8 Approval Submittals:
- 1.8.1 Product Data: Submit manufacturer's technical product data for:
- Cleanouts  
Floor drains
- 1.9 O&M Data Submittals: Submit a copy of all approval submittals. Include these data in O&M manual.

### 2 PRODUCTS

- 2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in soil and waste systems. Where more than one type of materials or products is indicated, selection is Installer's option.
- Underground-Type Plastic Line Marker: Manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct-burial service; not less than 6" wide x 4 mils thick. Provide green tape with black printing reading "CAUTION SEWER LINE BURIED BELOW".

- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following listed for each item.
- 2.3 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:
  - 2.3.1 Above Ground Soil, Waste, and Vent Piping:
    - 2.3.1.1 Polyvinyl chloride plastic pipe (PVC); Type DWV; non cellular core; PVC plastic type DWV socket-type fitting, solvent cement joints. Do not use in fire-rated assemblies or return air plenums.
  - 2.3.2 Underground Building Drain Piping (within 5 feet of the building):
    - 2.3.2.1 Pipe Size 6" and Smaller: Polyvinyl chloride sewer pipe (PVC); Type DWV; non cellular core; PVC plastic type DWV socket-type.
- 2.4 Pipe Specialties: Provide piping specialties complying with Division-15 Basic Materials and Methods section "Piping Specialties".
- 2.5 Supports and Anchors: Provide supports and anchors complying with Division-15 Basic Mechanical Materials and Methods section "Supports and Anchors".
- 2.6 Cleanouts: Provide factory-fabricated drainage piping products of size and type indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements and governing regulations. Josam, Jay R. Smith, Wade, Zurn.
  - 2.6.1 Cleanout Plugs: Cast-bronze or brass, threads complying with ANSI B2.1 countersunk head.
  - 2.6.2 Cleanout for PVC Systems:
    - 2.6.2.1 Floor Cleanouts: Cast-iron body with adjustable head, brass plug, and scoriated nick-brass cover. Furnish with carpet flange for carpeted floors. Furnish with recessed cover for tile floors. Furnish with clamping ring for floors with membrane. Wade W-6030 hub outlet for push-on.
    - 2.6.2.2 Cleanouts in Piping: PVC cleanout adaptor with threaded PVC plug.
    - 2.6.2.3 Wall Cleanouts: PVC cleanout adaptor with tapped, countersunk, threaded brass plug. Square 8.75"x8.75" hinged wall access cover, with scoriated nickel bronze finish.
    - 2.6.2.4 Grade Cleanouts: PVC cleanout adaptor with countersunk, threaded brass plug. Wade W-8590-D plug. In sidewalks and other finished concrete, provide access cover frames with a non-tilting tractor cover. Wade W-7035-Z or equal.
    - 2.6.2.5 Cleanouts in Paved Areas: Cast iron body, adjustable housing, ferrule with plug and round loose scoriated tractor cover. Wade W-8300-MF. Coordinate concrete depth at site with adjustable flange.
- 2.7 Floor Drains: Provide floor drains of size as indicated on drawings; and type, including features, as specified herein. Josam, Jay R. Smith, Wade, Zurn.

2.7.1 Floor Drains: Provide inside caulk bottom outlet or TY-Seal hub outlet with adaptor for cast iron trap installation and a 4" deep trap seal. Provide clamping rings for floors with membrane.

2.7.2 Strainer: Provide 5" satin-nickel bronze strainer.

2.7.3 Trap Primer Connection: Provide ½" trap primer tapping.

### 3 EXECUTION

3.1 Examine substrates and conditions under which soil and waste systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

#### 3.2 Piping Installation:

3.2.1 Install above grade soil and waste piping in accordance with Division-15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", and with Florida Building Code-Plumbing.

3.2.2 Install underground soil and waste pipes as indicated and in accordance with Florida Building Code-Plumbing. Lay underground piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install required gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements. Clean interior of piping of dirt and other superfluous material as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. Place plugs in ends of uncompleted piping at end of day or whenever work stops.

3.2.3 Install building soil and vent piping pitched to drain at minimum slope of ¼" per foot (2%) for piping smaller than 3", and 1/8" per foot (1%) for piping 3" and larger.

3.3 Install piping specialties in accordance with Division-15 Basic Mechanical Materials and Methods section "Piping Specialties".

3.4 Install supports and anchors in accordance with Division-15 Basic Mechanical Materials and Methods section "Supports and Anchors".

3.5 Installation of Cleanouts: Install in above ground piping and building drain piping as indicated, as required by Florida Building Code-Plumbing; and at each change in direction of piping greater than 45°; at minimum intervals of 50' for piping 4" and smaller and 100' for larger piping; and at base of each vertical soil or waste stack. Install floor and wall cleanout covers for concealed piping, select type to match adjacent building finish.

3.5.1 Size: Cleanouts shall be full size up to 4". Piping over 4" shall have a reducing fitting to accommodate a 4" cleanout unless indicated otherwise on drawings.

3.5.2 Install cleanouts to allow adequate clearance for rodding.

3.5.3 Protect all finished surfaces of cleanouts with a suitable adhesive covering until construction is completed.

3.5.4 Cleanouts to Grade: Provide an 18" x 18" x 8" thick concrete pad around the cleanout. Set the

cleanout ferrule, adapter, or access cover frame in the concrete as required. The cleanout shall be extended to the finished grade. The concrete pad shall slope away from the cleanout in all directions approximately one inch. Cover pad with fill to finished grade.

- 3.5.5 Cleanouts in Paved Areas: Provide concrete pad similar to cleanout to grade and coordinate concrete depth at site with adjustable flange. Access cover frames are required.
- 3.6 Flashing Flanges: Install flashing flange and clamping device with each stack and cleanout passing through waterproof membranes.
- 3.7 Installation of Floor Drains: Install floor drains in accordance with manufacturer's written instructions and in locations indicated.
  - 3.7.1 Coordinate flashing work with work of waterproofing and adjoining substrate work.
  - 3.7.2 Install floor drains at low points of surface areas to be drained, or as indicated. Set tops of drains flush with finished floor.
  - 3.7.3 Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes, where penetrated.
  - 3.7.4 Position drains so that they are accessible and easy to maintain.
- 3.8 Connection of Trap Primers: Connect trap primers as indicated, and in accordance with manufacturer's installation instructions. Pitch piping towards drain trap, minimum of 1/8" per foot (1%). Adjust trap primer for proper flow.
- 3.9 Piping Runouts to Fixtures: Provide soil and waste piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated, but in no case smaller than required by Florida Building Code-Plumbing.
- 3.10 Test, clean, flush, and inspect soil and waste piping in accordance with requirements of Division-15 Basic Mechanical Materials and Methods section "Testing, Cleaning and Sterilization of Piping Systems".

END OF SECTION 15410.

## SECTION 15430 - PLUMBING FIXTURES, EQUIPMENT, TRIM & SCHEDULE

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-15 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of plumbing fixtures work required by this section is indicated on drawings and schedules, and by requirements of this section.
- 1.4 Refer to Division-16 sections for field-installed electrical wiring required for plumbing fixtures; not work of this section.
- 1.5 Codes and Standards:
  - 1.5.1 Plumbing Fixture Standards: Comply with applicable portions of Florida Building Code-Plumbing pertaining to materials and installation of plumbing fixtures.
  - 1.5.2 ANSI Standards: Comply with applicable ANSI standards pertaining to plumbing fixtures and systems.
  - 1.5.3 PDI Compliance: Comply with standards established by PDI pertaining to plumbing fixture supports.
  - 1.5.4 UL Listing: Construct plumbing fixtures requiring electrical power in accordance with UL standards and provide UL-listing and label.
  - 1.5.5 ARI Compliance: Construct and install water coolers in accordance with ARI Standard 1010 "Drinking-Fountains and Self-Contained Mechanically-Refrigerated Drinking-Water Coolers", and provide Certification Symbol.
  - 1.5.6 ANSI Compliance: Construct and install barrier-free plumbing fixtures in accordance with ANSI Standard A117.1 "Specifications for Making Buildings and Facilities Accessible To and Usable By Physically Handicapped People".
- 1.6 Approval Submittals:
  - 1.6.1 Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, furnished specialties and accessories; and installation instructions. Submit manufacturer's assembly-type drawings indicating dimensions, roughing-in requirements, required clearances, and methods of assembly of components and anchorages. The submittal shall be organized by "fixture number" and each fixture package shall be so identified. Each fixture package shall include all of the required fitting and trim, even if such devices are used for more than one fixture.
- 1.7 O&M Data Submittals: Submit a copy of approval submittals. Submit maintenance data and parts lists for each type of plumbing fixture and accessory; including "trouble-shooting"

maintenance guide. Include these data in O&M manual.

1.8 Handle plumbing fixtures carefully to prevent breakage, chipping and scoring fixture finish. Do not install damaged plumbing fixtures; replace and return damaged units to equipment manufacturer.

## 2 PRODUCTS

2.1 General: Provide factory-fabricated fixtures of type, style and material indicated. For each type fixture, provide trim, carrier, seats, and valves as specified. Where not specified, provide products as recommended by manufacturer, and as required for complete installation. Where more than one type is indicated, selection is Installer's option; but, all fixtures of same type must be furnished by single manufacturer. Where type is not otherwise indicated, provide fixtures complying with governing regulations.

2.2 Model Numbers: Basis of design model numbers of a particular manufacturer are listed in the fixture schedule as an aid to contractors. Where conflicts between the model number and the written description occur, the written description shall govern. Where acceptable manufacturers are listed, products are subject to compliance with requirements.

2.3 Refer to plumbing construction documents for fixture schedule.

### 2.4 Materials:

2.4.1 Provide materials which have been selected for their surface flatness and smoothness. Exposed surfaces which exhibit pitting seam marks, roller marks, foundry sand holes, stains, decoloration, or other surface imperfections on finished units are not acceptable.

2.4.2 All fixtures shall be white vitreous china unless otherwise specifically noted. Where enameled iron fixtures are specified, they shall be furnished with acid resisting enamel.

2.4.3 Where fittings, trim and accessories are exposed or semi-exposed provide bright chrome-plated or polished stainless steel units. Provide copper or brass where not exposed.

2.4.4 Stainless Steel Sheets: ASTM A 167, Type 302/304, hardest workable temper. Finish shall be No. 4, bright, directional polish on exposed surfaces.

2.4.5 Vitreous China: High quality, free from fire cracks, spots, blisters, pinholes and specks; glaze exposed surfaces, and test for crazing resistance in accordance with ASTM C 554.

2.4.6 Synthetic Stone: High quality, free from defects, glaze on exposed surfaces, stain resistant.

### 2.5 Plumbing Fittings, Trim and Accessories:

2.5.1 Faucets: At locations where water is supplied (by manual, automatic or remote control), provide commercial quality chrome-plated, cast-brass faucets, valves, or other dispensing devices, of type and size indicated, and as required to operate as indicated.

2.5.1.1 Automatic Faucets: Provide electronic sensor-operated faucets with 0.5 gpm vandal-resistant spray head. Set volume adjustment at 0.25 gallons per operation. Provide box-mounted, hard-wired transformer (120 VAC primary - 24 VAC secondary) with each faucet. All wiring and

electrical connections shall be provided by Division - 16.

2.5.1.2 Aerators: Provide aerators of types approved by Health Department having jurisdiction.

2.5.1.3 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Chicago Faucet Co., Kohler Co., Speakman Co., T & S Brass and Bronze Works, Water Saver Faucet Co.

2.5.2 Stops: Provide chrome-plated brass, angle type, manual shutoff valves and 3/8" chrome-plated flexible supply pipes to permit fixture servicing without shutdown of water supply piping systems for all fixtures. Coordinate with fixture requirements.

Provide loose key stops.

2.5.2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Zurn or approved equal.

2.5.3 Waste Outlets: Provide removable P-traps, drains, waste arms, tailpieces and wastes-to-wall where drains are indicated for direct connection to drainage system for all fixtures unless otherwise noted. Provide drains, tailpieces and waste arms where indirect drains are indicated. Waste outlets shall be full size of fixture drain connection.

2.5.3.1 Provide chrome-plated cast-brass P-traps and drains with cleanout.

2.5.3.2 P-traps, wastes and drains of all types shall be 17-gauge.

2.5.3.3 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Zurn, or approved equal.

2.5.4 Flush Valves: Provide quiet-flush, chrome-plated, cast-brass flush valves with vacuum breaker and screwdriver stop. Where handicap service is indicated, provide ADA compliant handles with the handle on the wide side of the stall.

2.5.4.1 Automatic Flush Valves: Provide self-adaptive, electronic, infrared-sensor operated flush valves with 24 volt solenoid operator and override button. Provide a box-mounted, hard-wired transformer (120 VAC primary - 24 VAC secondary) with each flush valve. Provide matching wall cover plates each with four vandal-resistant screws. All wiring and electrical connections shall be provided by Division - 16.

2.5.4.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Sloan Valve Co. or Zurn.

2.5.5 Carriers: Provide cast-iron supports for fixtures of either graphitic gray iron, ductile iron, or malleable iron or steel as indicated. Coordinate with specific fixture requirements and conditions of the project.

2.5.5.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Josam, Wade, Zurn, J.R. Smith.

2.5.6 Fixture Bolt Caps: Provide manufacturer's standard exposed fixture bolt caps finished to match fixture finish.

- 2.5.7 Escutcheons: Where fixture supplies and drains penetrate walls in exposed locations, provide chrome-plated brass escutcheons with friction clips or set screws.
- 2.5.8 Comply with additional fixture requirements listed for each fixture and as required for a complete and functional system.
- 2.6 Water Closets:
- 2.6.1 General: Provide white china siphon jet type unless otherwise noted.
- 2.6.1.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Crane, Kohler, or Zurn.
- 2.6.2 Fixture Seats: Provide white, heavy molded plastic fixture seats with stainless steel self-sustaining check hinges.
- 2.6.2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Bemis Mfg. Co., Beneke Corp., Church or Comfort Seats.
- 2.7 Urinals:
- 2.7.1 General: Provide white china siphon jet wall hung type with ¾" top spud and 2" outlet unless otherwise noted. Provide short foot carrier with top and bottom hanger plates.
- 2.7.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Crane, Kohler, or Zurn.
- 2.8 Lavatories:
- 2.8.1 General: Provide white china lavatories.
- 2.8.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Crane, Kohler, or Zurn.
- 2.9 Electric Water Coolers:
- 2.9.1 General: Provide self-contained electric water cooler with entire water system free of lead. All joints shall be made using silver solder. Units shall be complete with an air-cooled refrigeration system consisting of a hermetic compressor, cooler, pre-cooler, condenser fan, thermostat safety controls and all other related devices. The unit shall have a capacity of 8 gallons per hour. The cabinet shall be stainless steel with vermin proof insulation. The top shall be fabricated of stainless steel with a No. 4 finish. Where handicap units are indicated, the bubbler and fountain shall be ADA compliant.
- 2.9.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Elkay Mfg. Co., Halsey Taylor Div., Oasis.

- 2.10      Stainless Steel Sinks:
- 2.10.1    General: Provide Type 304, 18 gauge self-rimming stainless steel back ledge with No. 4 finish . Provide sound deadening material on the sides and bottom of the sink. Provide grid drain or strainer with removable crumb cup and stopper as indicated.
- 2.10.2    Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Elkay, Just
- 2.11      Water Heaters:
- 2.11.1    Electric Water Heaters:
- 2.11.2    Accessories: VB, relief, pan, stand, etc.
- 2.11.3    Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Ruud, Rheem, Mor-Flo, State, A.O. Smith.
- 2.12      Thermostatic Mixing Valves:
- 2.12.1    General:
- 2.12.2    Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Zurn, Watts, or approved equal.

#### EXECUTION

- 2.13      Examine roughing-in work of potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Also examine floors and substrates, and conditions under which fixture work is to be accomplished. Correct any incorrect locations of piping, and other unsatisfactory conditions for installation of plumbing fixtures. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- 2.14      Install plumbing fixtures of types indicated where shown and at indicated heights. Install in accordance with fixture manufacturer's written instructions, roughing-in drawings, and with recognized industry practices. Install in accordance with ADA and applicable handicap code requirements. Ensure that plumbing fixtures comply with requirements and serve intended purposes. Comply with applicable requirements of Florida Building Code-Plumbing pertaining to installation of plumbing fixtures. Furnish templates for cut-outs in countertops. Coordinate exact fixture locations with countertop shop drawings.
- 2.15      Fasten plumbing fixtures securely to indicated supports or building structure; and ensure that fixtures are level and plumb. Secure plumbing supplies behind or within wall construction so as to be rigid, and not subject to pull or push movement. Mount at heights shown on the drawings. Fixture heights are floor-to-rim distance. Fitting heights are to centerline.
- 2.16      Install stop valve in water supply to each fixture.
- 2.17      After fixtures are set, the crack between the fixture and wall shall be caulked with DAP silicone-based caulking, or approved equal.

- 2.18 Protect installed fixtures from damage during remainder of construction period.
- 2.19 Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.
- 2.20 Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect/Engineer. Remove cracked or dented units and replace with new units.
- 2.21 Clean plumbing fixtures, trim, aerators, and strainers of dirt and debris upon completion of installation.
- 2.22 Adjust water pressure at drinking fountains, faucets, and flush valves to provide proper flow stream and specified gpm.
- 2.23 Adjust or replace washers to prevent leaks at faucets and stops.

END OF SECTION 15430

## SECTION 15710 - SPLIT SYSTEM AIR CONDITIONING UNITS

### 1 GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 Division-15 Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Refer to other Division-15 sections for testing, adjusting, and balancing of air conditioning units (AHUs).

#### 1.4 Approval Submittals:

1.4.1 Product Data: Submit manufacturer's technical product data, including dimensions, ratings, electrical characteristics, weight, capacities, materials of construction, and installation instructions.

Split system units  
Vibration Isolation

1.5 O&M Data Submittals: Submit manufacturer's maintenance data including parts lists. Include these data, a copy of approval submittals, product data, and wiring diagrams in O&M manual.

### 2 PRODUCTS

#### 2.1 Quality Assurance:

2.1.1 Provide units tested by UL, ARL or ETL.

2.1.2 Construct refrigeration system in accordance with ASHRAE 15 (ANSI B 9.1) "Safety Code for Mechanical Refrigeration".

2.1.3 Test and rate AHUs in accordance with the applicable ARI standards and provide certified rating seal. Sound test and rate units in accordance with ARI 270.

2.1.4 Provide units with an EER or SEER that meets the Florida Energy Efficiency Code and the schedules on the drawings.

2.1.5 Acceptable Manufacturers: Subject to compliance with requirements provide units by: Carrier, Trane, Lennox, York or approved equal.

#### 2.2 General:

2.2.1 Units shall be factory-assembled, wired and tested. All controls shall be factory-adjusted and preset to the design conditions.

2.2.2 Casings: Construct of heavy gauge steel (or aluminum) formed panels rigidly reinforced and braced. Each unit shall be provided with removable panels to permit the unit (including fans and compressors) to be properly maintained and serviced. Entire casing shall be painted with

factory-applied finish. Casing for outdoor units shall be provided with weatherproof construction with all seams bolted.

2.2.3 Supports: Provide concrete pad 4" larger than the unit on all sides.

2.3 Condensing Unit:

2.3.1 Condenser Fans and Drives: Fan shall of rustproof construction: hot-dipped galvanized steel, stainless steel or aluminum. Unit shall have a variable speed motor suitable for the duty indicated. Provide a close fretwork galvanized steel or non-ferrous fan and guard. Motors shall be the permanently lubricated type, resiliently mounted.

2.3.2 Condenser Coil: Construct of copper nonferrous tubes and nonferrous fins. Provide inlet guard to protect condenser fins. Provide seacoast or heresite coating on the condenser coil.

2.3.3 Compressor: Shall be scroll, hermetic, or semi-hermetic reciprocating design for R410a refrigerant with vibration isolation. Each compressor shall have separate refrigerant circuit. Motors shall be ball bearing, high starting torque, low starting current type for compressor service. Compressors shall not produce objectionable noise or vibration inside the building. Compressors shall have five (5) year warranty. Provide dual compressor machines if scheduled.

2.3.4 Service Valves: Provide for high and low pressure readings.

2.4 Evaporator Unit:

2.4.1 Interior of unit shall be thermally and acoustically insulated with minimum R=4.2 insulation. Provide removable panels to permit the unit to be properly serviced and maintained.

2.4.2 The evaporator shall include centrifugal fan, fan motor, direct drive and lubricated bearings. Motors shall be high efficiency type as per Division-15, Basic Mechanical Materials and Methods section, "Motors". Provide cooling coils constructed of copper tubes and aluminum fins. Filters and coils shall be selected for a maximum face velocity of 500 fpm. Provide thermal expansion valve, sight glass, refrigerant drier, strainer, controls and other necessary devices for a completely automatic unit.

2.4.3 Each unit shall be equipped with sloped IAQ drain pans under the entire evaporator coil to prevent condensate carry-over.

2.5 Electric Heater Section:

2.5.1 Provide electric heating coils controlled by one or more magnetic contactors. Three phase coils shall be wired for balanced current in each wire, if possible. Furnish and install necessary overheating and air flow controls to meet the requirements of the National Electric Code. Provide built-in air flow switch and heater interlock relay.

2.5.2 Heaters shall be factory mounted and wired with all required fuses and contactors to provide single point connection.

2.6 Unit Controls:

- 2.6.1 All safety and operational controls shall be factory wired.
- 2.6.2 Safety and Operational Control Features:
- Internal compressor overtemperature protection.
  - Crankcase heaters.
  - Individual motor overcurrent protection.
  - High pressure cutout.
  - Low pressure cutout.
  - Anti-recycle timer (5 minute)
  - Timer-type defrost control.
  - Phase failure and low voltage protection.
  - Liquid line solenoid.
- 2.7 Refrigerant Piping:
- 2.7.1 Copper tubing ¾" and smaller: Type ACR, hard-drawn temper tubing; wrought-copper, solder-joint fitting; brazed joints.
- 2.7.2 Copper tubing 7/8" – 4-1/8": Type ACR, hard-drawn temper tubing; wrought-copper, solder-joint fitting; brazed joints.
- 2.7.3 Silver solder material: Silver solder bearing at least 15% silver; Sil Fos.
- 2.8 Basic Vibration Isolation: Provide vibration isolation products complying with Division-15 section "Vibration Isolation" and the following list:
- 2.8.1 Equipment Mounting: Type EM5
- 3 EXECUTION
- 3.1 Installation: Install in accordance with producer's printed instructions. Brush out fins on all coils.
- 3.2 Support: Mount outdoor units on concrete pads with manufacturer's recommended service and operating clearance.
- 3.3 Mount indoor units smaller than 5 tons on vibration isolation. Mount indoor units larger than 5 tons on vibration isolation and concrete pads.
- 3.4 Brush out fins on all coils.
- 3.5 Refrigerant Piping: Comply with ANSI B31.5, "Refrigerant Piping," (except lower pressure limits below 15 psig), and ASHRAE 15 (ANSI B9.1). Make all joints carefully and neatly. Clean pipe and fittings before fluxing. Remove burrs. Braze by the sweat method using Sil Fos. Install field installed refrigerant devices and valves as required.
- 3.6 Testing: After job erection, or modification of factory installed piping, pressure test for leaks at 150 psig using a nominal amount of a suitable tracer refrigerant and dry nitrogen or a suitable refrigerant. Perform leak tests with an electronic halide leak detector having a sensitivity of at least ½ ounce R-12 per year. Refrigeration piping will not be accepted unless

it is gas tight.

- 3.7 Evacuation: After completing the successful pressure test, multiple-evacuate the system. Leave the compressor isolation valves shut and connect the vacuum pump to both the high and low sides. Evacuate the system to an absolute pressure of 1,500 microns. Then break vacuum to 2 psig with dry nitrogen. Repeat this process. Install the proper biflow drier in the liquid line and evacuate the system to 500 microns. Leave vacuum pump running for at least two hours without interruption. Break vacuum with the refrigerant to be used and raise pressure to 2 psig. Do not operate compressors during the evacuation procedure.
- 3.8 Charging: After completing the successful evacuation procedure, charge refrigerant directly to the system from the original containers through a filter drier. Charge to the manufacturer's stated conditions of pressure for required temperature. Weigh the refrigerant added and record on the startup report.
- 3.9 Construction Filters: Provide 2" thick filters in all units during construction. After construction (but prior to the test and balance being performed) install clean final filters.
- 3.10 Cleaning: Clean tar and all other soil from housing exterior. Leave ready for Division 7, Caulking Work. Caulk around pipe sleeves.
- 3.11 Condensate Drain: Pipe trapped copper condensate drain (full size of unit outlet) to nearest floor/roof drain or as shown on the drawings. Refer to Division-15 section "Insulation" for pipe insulation.
- 3.12 Startup: Check entire assembly for correctness of installation, alignment, and control sequencing. Start all component parts in proper sequence. Make all adjustments required to insure proper smooth quiet operation.

END OF SECTION 15710

## SECTION 15810 - FANS

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-15 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of fan work required by this section as indicated on drawings and schedules, and by requirements of this section.
- 1.4 Coordination:
  - 1.4.1 Refer to Division-7 sections for installation of prefabricated roof curbs; not work of this section. Furnishing prefabricated roof curbs is part of this section's work.
  - 1.4.2 Refer to Division-15 section "Testing, Adjusting, and Balancing" for balancing of fans.
  - 1.4.3 Refer to Division-15 HVAC control systems sections for control work required in conjunction with fans.
  - 1.4.4 Refer to Division-16 sections for power supply wiring from power source to power connection on fans. Division-16 work will include starters, disconnects, and required electrical devices, except where specified as furnished, or factory-installed, by manufacturer.
- 1.5 Codes and Standards:
  - 1.5.1 AMCA Compliance: Provide fans which have been tested and rated in accordance with AMCA standards, and bear AMCA Certified Ratings Seal.
  - 1.5.2 UL Compliance: Provide fans which are listed by UL and have UL label affixed.
- 1.6 Approval Submittals:
  - 1.6.1 Product Data: Submit manufacturer's technical data for fans, including specifications, capacity ratings, dimensions, weights, materials, accessories furnished, and installation instructions. Submit assembly-type drawings showing unit dimensions, construction details, methods of assembly of components, and field connection details.

Fans  
Vibration Control

- 1.7 O&M Data Submittals: Submit maintenance data and parts list for each type of fan, accessory, and control. Include these data, a copy of approved submittals, and wiring diagrams in O&M Manual.

### 2 PRODUCTS

- 2.1 General: Except as otherwise indicated, provide standard prefabricated fans of type and size

indicated, modified as necessary to comply with requirements, and as required for complete installation. Provide accessories as listed in the schedule on the drawings and as described herein. Motors shall be high efficiency per Division-15 section "Motors".

- 2.2 Acceptable Manufacturers: Subject to compliance with requirements provide fans manufactured by Acme, Greenheck, Loren Cook, Penn, or approved equal unless otherwise noted herein.
- 2.3 In-Line Centrifugal Fans:
  - 2.3.1 Housing: Provide round aluminum or square weather tight housing constructed of steel and painted inside and out with an epoxy finish. Provide venturi type inlet.
  - 2.3.2 Fan Wheels: Provide aluminum air foil type, backward curved, statically and dynamically balanced.
  - 2.3.3 Drive: Provide direct or belt drive as scheduled with pre-lubricated, ball bearing, continuous duty type motors. Provide vibration isolation equipment for the entire drive.
  - 2.3.4 Isolation and Support: Provide spring type vibration isolators and fan support brackets.
- 2.4 Propeller Wall Fans:
  - 2.4.1 Housing: Provide heavy duty all-welded steel housing and supports with epoxy finish. Panels shall have streamlined orifices.
  - 2.4.2 Fan: Provide air foil type steel or aluminum propellers.
  - 2.4.3 Drive: Provide direct or belt drive as scheduled with pre-lubricated, ball bearing, continuous duty type motors. Provide vibration isolation equipment for the entire drive.
  - 2.4.4 Wall Collar or Housing: Provide galvanized steel fan wall collar or housing as required.
  - 2.4.5 Fan Guard: Provide OSHA approved galvanized steel mesh fan guard.
- 2.5 Vibration Isolation: Mount fans on vibration isolators in accordance with the requirements of Division-15 section "Vibration Isolation" and the following list.
  - 2.5.1 Hangers: Type HA3.
- 3 EXECUTION
  - 3.1 General: Except as otherwise indicated or specified, install fans in accordance with manufacturer's installation instructions and recognized industry practices to insure that fans serve their intended function.
  - 3.2 Coordinate fan work with work of walls and ceilings as necessary for proper interfacing. Framing of openings, caulking, and curb installation is not work of this section.
  - 3.3 Ductwork: Refer to Division-15 section "Ductwork". Connect ducts to fans in accordance

with manufacturer's installation instructions. Provide flexible connections in ductwork at fans.

- 3.4 Install fans on vibration isolation equipment as required. Set level and plumb.
- 3.5 Electrical Wiring: Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to electrical Installer. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-16 sections. Verify proper rotation direction of fan wheels. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.
- 3.6 Remove shipping bolts and temporary supports within fans. Adjust dampers for free operation.
- 3.7 Testing: After installation of fans has been completed, test each fan to demonstrate proper operation of units at performance requirements specified. When possible, field correct malfunctioning units, then retest to demonstrate compliance. Replace units which cannot be satisfactorily corrected.
- 3.8 Cleaning: Clean factory-finished surfaces. Remove all tar and soil. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

END OF SECTION 15810.

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## SECTION 15840 - HVAC METAL DUCTWORK

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-15 Basic Mechanical Materials and Methods Sections apply to work of this section.
- 1.3 Extent of HVAC metal ductwork is indicated on drawings and in schedules, and by requirements of this section.
- 1.4 Refer to other Division-15 sections for exterior insulation of metal ductwork.
- 1.5 Refer to other Division-15 sections for ductwork accessories.
- 1.6 Codes and Standards:
  - 1.6.1 SMACNA Standards: Comply with SMACNA's "HVAC Duct Construction Standards, Metal and Flexible" 1985 Edition for fabrication and installation of metal ductwork, unless otherwise noted.
  - 1.6.2 NFPA 90A Compliance: Comply with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".
- 1.7 Approval Submittals:
  - 1.7.1 Product Data: Submit manufacturer's technical product data and installation instructions for the following.
    - Factory-fabricated ductwork
    - Sealants
    - Duct liner
    - Adhesive
    - Flexible duct
    - Spin-in fittings
    - Side take-off fittings
  - 1.7.2 Shop Drawings: Submit scaled layout drawings of HVAC metal ductwork and fittings including, but not limited to, duct sizes, locations, elevations, and slopes of horizontal runs, wall and floor penetrations, and connections. Show interface and spatial relationship between ductwork and proximate equipment. Show modifications of indicated requirements, made to conform to local shop practice, and how those modifications ensure that free area, materials, and rigidity are not reduced.

### 2 PRODUCTS

- 2.1 Ductwork Materials:

- 2.1.1 Exposed Ductwork Materials: Where ductwork is indicated to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, stains and discolorations, and other imperfections, including those which would impair painting.
- 2.1.2 Galvanized Sheet Metal: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ASTM A 527, lockforming quality; with G 90 zinc coating in accordance with ASTM A 525; and mill phosphatized for exposed locations. Stamp gauge and manufacturer's identification on each sheet. Break sheets so that identification is exposed.
- 2.2 Miscellaneous Ductwork Materials:
- 2.2.1 General: Provide miscellaneous materials and products of types and sizes indicated and, where not otherwise indicated, provide type and size required to comply with ductwork system requirements including proper connection of ductwork and equipment.
- 2.2.2 Duct Sealant: Provide non-hardening, non-migrating mastic or liquid elastic sealant, type applicable for fabrication/installation detail, as compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork.
- 2.2.3 Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.
- 2.2.4 Flexible Ducts: Provide flexible ductwork with an R-value of R-6 unless the ductwork is in a ceiling return plenum. The use of flexible ductwork for connection of supply air and return air devices is acceptable only where shown on the drawings.
- 2.2.4.1 Construction: Provide reinforced metalized polyester jacket that is tear and puncture resistant, air tight inner core with no fiberglass erosion in the air stream and an encapsulated wire helix. Flexible ductwork shall have a recommended operating pressure of 6" w.g. for sizes 4" through 12" diameter and 4" w.g. for sizes 14" through 20" diameter. All diameters shall be suitable for a negative operating pressure of 0.75" w.g. Flexible ductwork shall meet the requirements of UL-181, the Florida Energy Code, FBC, NFPA 90A and NFPA 90B.
- 2.2.4.2 Acceptable Manufacturers: Subject to compliance with requirements, provide R-6 flexible ductwork by: Atco 36, Flexmaster 8M-R6 or Thermaflex M-KE R6.
- 2.2.5 Spin-in and Side Take-off Fittings: Provide round branch run-outs as follows.
- 2.2.5.1 Round flexible duct takeoffs shall be straight sided with damper and one inch high insulation standoff equal to Crown 724-D5 or Flexmaster FLD-BO.
- 2.2.5.2 Where duct height does not permit the use of conical spin-in fittings, use low profile side take-off fittings equal to Crown 3300-DS or Flexmaster STOD-BO.
- 2.2.6 Fittings: Provide radius type fittings fabricated of multiple sections with maximum 15° change of direction per section. Unless specifically detailed otherwise, use 45° laterals and 45° elbows for branch takeoff connections. Where 90° branches are indicated, provide conical type tees.
- 2.3 Fabrication:

- 2.3.1 Shop fabricate ductwork in 4, 8, 10 or 12-ft lengths, unless otherwise indicated or required to complete runs. Preassemble work in shop to greatest extent possible, so as to minimize field assembly of systems. Disassemble systems only to extent necessary for shipping and handling. Match-mark sections for reassembly and coordinated installation.
- 2.3.2 Shop fabricate ductwork of gauges and reinforcement complying with SMACNA "HVAC Duct Construction Standards", except provide sealant at all joints. Supply duct from air conditioning units and all return and exhaust duct shall be minimum 2" pressure class unless otherwise noted.
- 2.3.3 Fabricate duct fittings to match adjoining ducts, and to comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with center-line radius equal to 1½ times associated duct width; and fabricate to include turning vanes in elbows where shorter radius is necessary. Limit angular tapers to 30° for contracting tapers and 20° for expanding tapers.
- 2.3.4 Fabricate ductwork with accessories installed during fabrication to the greatest extent possible. Refer to Division-15 section "Ductwork Accessories" for accessory requirements.
- 2.4 Factory-Fabricated Low Pressure Ductwork (Maximum 2" W.G.):
- 2.4.1 Material: Galvanized sheet steel complying with ASTM A 527, lockforming quality, with ASTM A 525, G90 zinc coating, mill phosphatized.
- 2.4.2 Gauge: 28-gauge minimum for round ducts and fittings, 4" through 8" diameter. 26-gauge minimum 9" through 14", 24-gauge minimum 15" through 26".
- 2.4.3 Elbows: One piece construction for 90° and 45° elbows 14" and smaller. Provide multiple gore construction for larger diameters with standing seam circumferential joint.
- 2.4.4 Divided Flow Fittings: 90° tees, constructed with saddle tap spot welded and bonded to duct fitting body.
- 2.4.5 Acceptable Manufacturers: Subject to compliance with requirements, provide factory-fabricated ductwork by Semco Mfg., Inc. or United Sheet Metal Div., United McGill Corp, or approved equal.

### 3 EXECUTION

- 3.1 General: Examine areas and conditions under which HVAC metal ductwork is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- 3.2 Installation Of Metal Ductwork:
- 3.2.1 General: Assemble and install ductwork in accordance with recognized industry practices which will achieve air-tight (5% leakage for systems rated 3" and under; 1% for systems rated over 3") and noiseless (no objectionable noise) systems, capable of performing each indicated service. Install each run with minimum number of joints. Align ductwork accurately at connections, within 1/8" misalignment tolerance and with internal surfaces smooth. Support

ducts rigidly with suitable ties, braces, hangers and anchors of type which will hold ducts true-to-shape and to prevent buckling. Support vertical ducts at every floor.

- 3.2.2 Supports: Install concrete inserts for support of ductwork in coordination with formwork, as required to avoid delays in work. Install self-drilling screw anchors in prestressed concrete or existing work.
- 3.2.3 Field Fabrication: Complete fabrication of work at project as necessary to match shop-fabricated work and accommodate installation requirements. Seal joints in round or oval ductwork with hard cast or shrink bands, and sheet metal screws, or by welding.
- 3.2.4 Routing: Locate ductwork runs, except as otherwise indicated, vertically and horizontally. Avoid diagonal runs wherever possible. Locate runs as indicated by diagrams, details and notations or, if not otherwise indicated, run ductwork in shortest route which does not obstruct useable space or block access for servicing building and its equipment. Hold ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building. Limit clearance to ½" where furring is shown for enclosure or concealment of ducts, but allow for insulation thickness, if any. Where possible, locate insulated ductwork for 1" clearance outside of insulation. In finished and occupied spaces, conceal ductwork from view by locating in mechanical shafts, hollow wall construction or above suspended ceilings, unless specifically noted as "Exposed". Do not encase horizontal runs in solid partitions, except as specifically shown. Coordinate layout with suspended ceiling and lighting layouts and similar finished work.
- 3.2.5 Electrical Equipment Spaces: Do not route ductwork through transformer vaults or other electrical equipment spaces and enclosures.
- 3.2.6 Penetrations: Where ducts pass through interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gauge as duct. Overlap opening on 4 sides by at least 1½". Fasten to duct and substrate. Where ducts pass through fire-rated floors, walls, or partitions, provide firestopping between duct and substrate.
- 3.2.7 Coordination: Coordinate duct installations with installation of accessories, dampers, coil frames, equipment, controls and other associated work of ductwork system.
- 3.2.8 Installation: Install metal ductwork in accordance with SMACNA HVAC Duct Construction Standards. Fan discharge outlet ducts shall be installed correctly with regard to "system effect" per AMCA Publication 201.
- 3.3 Installation of Flexible Ducts:
  - 3.3.1 Maximum Length: For any duct run using flexible ductwork, do not exceed 5'-0" extended length. Flexible duct shall only be allowed as detailed on the drawings.
  - 3.3.2 Installation: Install in accordance with Section III of SMACNA's "HVAC Duct Construction Standards, Metal and Flexible". Support flexible ducts to eliminate pinching and kinking which would restrict flow.
  - 3.3.3 2" Pressure Class Ductwork: Peel back insulation and slide the inner core over the spin-in or diffuser neck, seal with duct sealant and install Panduit strap tightly. Slide insulation back

over the inner core and install another Panduit strap over the insulation outer jacket. Tape is not acceptable.

- 3.3.4 Seal all exposed edges of fiberglass insulation with glassfab and mastic.
- 3.4 Leakage Tests: After each duct system is completed, test for duct leakage in accordance with Sections 3 and 5 of the SMACNA HVAC Air Duct Leakage Test Manual. Test pressure shall be equal to pressure class of duct, less 0.5" static pressure. Repair leaks and repeat tests until total leakage is less than 5% of system design air flow for low pressure systems and less than 1% for systems rated over 3".
- 3.5 Equipment Connections: Connect metal ductwork to equipment as indicated, provide flexible connection for each ductwork connection to equipment mounted on vibration isolators, and/or equipment containing rotating machinery. Provide access doors as indicated.
- 3.6 Clean ductwork internally free of dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration. Keep ducts closed with poly during construction to prevent contamination by construction dust and debris.
- 3.7 Balancing: Refer to Division-15 section "Testing, Adjusting, and Balancing" for air distribution balancing of metal ductwork; not work of this section. Seal any leaks in ductwork that become apparent in balancing process.
- 3.8 System Adjustment: Adjust the system to provide functional operation to the extent possible, and leave ready for Testing and Balancing work. It is not the intent of this section to provide final testing and balancing, but to leave the system operational with a minimum of noise.

END OF SECTION 15840.

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## SECTION 15855 - DUCTWORK ACCESSORIES

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-15 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of ductwork accessories work is indicated on drawings and in schedules, and by requirements of this section.
- 1.4 Refer to other Division-15 sections for testing, adjusting, and balancing of ductwork accessories; not work of this section.
- 1.5 Codes and Standards:
  - 1.5.1 SMACNA Compliance: Comply with applicable portions of both SMACNA "HVAC Duct Construction Standards, Metal and Flexible" and "Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems".
  - 1.5.2 UL Compliance: Construct, test, and label fire dampers in accordance with UL Standard 555 "Fire Dampers and Ceiling Dampers".
  - 1.5.3 NFPA Compliance: Comply with applicable provisions of NFPA 90A "Air Conditioning and Ventilating Systems" pertaining to installation of ductwork accessories.
- 1.6 Approval Submittals:
  - 1.6.1 Product Data: Submit manufacturer's technical product data for each type of ductwork accessory, including dimensions, capacities, and materials of construction; and installation instructions as follows:
    - Low pressure manual dampers
    - Control dampers
    - Fire Dampers
    - Duct access doors
    - Flexible connections
  - 1.6.2 O&M Data Submittals: Submit manufacturer's maintenance data including parts lists for control dampers. Include this data, product data, and a copy of approval submittals in O&M manual.

### 2 PRODUCTS

#### 2.1 Dampers:

- 2.1.1 Low Pressure Manual Dampers: Provide 16 gauge dampers of single-blade type (12" maximum blade width) or multiblade type. Damper blades to be gang-operated from a single shaft with nylon or ball bearings on each end. Provide indexed locking quadrant. Parallel or

opposed blade style is acceptable. Provide 2" standoff on locking quadrant for externally insulated duct.

2.1.2 Control Dampers: Provide dampers with parallel blades for 2-position control or opposed blades for modulating control. Construct blades of 16-ga. steel. Provide heavy-duty molded self-lubricating nylon bearings and 1/2" diameter steel axles spaced on 9" centers. Provide sponge rubber or felt blade edges. Construct frame of 2" x 1/2" x 1/8" steel channel for face areas 25 sq. ft. and under; 4" x 1-1/4" x 16-ga. channel for face areas over 25 sq. ft. Provide galvanized steel finish with aluminum touch-up. Actuators (motors) are provided by control contractor.

2.1.3 Acceptable Manufacturers: Subject to compliance with requirements, provide dampers by Air Balance, American Warming & Ventilating, Arrow Louver and Damper, Penn Ventilator Co., Greenheck, or Ruskin Mfg. Co.

2.2 Turning Vanes: Provide manufactured or fabricated single wall turning vanes and vane runners, constructed in accordance with SMACNA "HVAC Duct Construction Standards".

2.3 Fire Dampers:

2.3.1 Fire Dampers: Provide curtain type fire dampers, UL classified and labeled per UL 555, of types and sizes indicated. Construct casings and blades of galvanized steel. Damper shall not restrict duct free area when open. Dampers shall be rated for dynamic closure under flow and pressure. Provide sleeves and mounting angles. Provide fusible link rated at 160 to 165° F unless otherwise indicated. Provide damper with positive lock in closed position. All dampers shall be spring activated. Basis of design:

1-1/2 HR: Ruskin IBD2 - Style B for rectangular, Style CR for round, Style CO for oval.

1-1/2 HR: Ruskin IBDT for transfer grilles in narrow partitions.

3 HR: Ruskin IBD23 - Style B for rectangular, Style CR for round, Style CO for oval.

2.4 Duct Access Doors:

2.4.1 General: Provide duct access doors of size indicated, or as required for duty indicated.

2.4.2 Construction: Construct of same or greater gauge as ductwork served. Provide insulated doors for insulated ductwork. Provide flush frames for uninsulated ductwork, extended frames for externally insulated duct. Provide one side hinged, other side with one handle-type latch for doors 12" high and smaller, 2 handle-type latches for larger doors.

2.4.3 Acceptable Manufacturers: Subject to compliance with requirements, provide access doors by Air Balance, Inc., Duro Dyne Corp., Ruskin Mfg. Co., or Ventfabrics, Inc.

2.5 Flexible Connections:

2.5.1 General: Provide flexible duct connections wherever ductwork connects to vibration isolated equipment. Construct flexible connections of neoprene-coated flameproof fabric crimped into duct flanges for attachment to duct and equipment. Make airtight joint. Provide adequate joint flexibility to allow for thermal, axial, transverse, and torsional movement, and also capable of

absorbing vibrations of connected equipment.

- 2.5.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following: Duro Dyne Corp., Flexaust (The) Co., or Ventfabrics, Inc.

### 3 EXECUTION

- 3.1 Examine areas and conditions under which ductwork accessories will be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

#### 3.2 Installation of Ductwork Accessories:

- 3.2.1 Install ductwork accessories in accordance with manufacturer's installation instructions, with applicable portions of details of construction as shown in SMACNA standards, and in accordance with recognized industry practices to ensure that products serve intended function.

- 3.2.2 Install balancing dampers at all main ducts adjacent to units in return air, outside air and where indicated.

- 3.2.3 Install control dampers in the outside air intake duct for each air handling unit.

- 3.2.4 Install turning vanes in square or rectangular 90° elbows in supply, return, and exhaust air systems, and elsewhere as indicated.

- 3.2.5 Install fire dampers within fire walls and floors at locations shown on the mechanical drawings. Install in strict accordance with the manufacturer's printed instructions, NFPA 90A, and UL 555. Basis of design installation is detailed on the drawings.

- 3.2.6 Fire and Smoke Dampers: Notify Engineer at least 24 hours in advance of ceiling installation or chase closure so that complete fire and smoke damper installation can be observed. A copy of the manufacturer's printed installation instructions shall be available at the site.

- 3.2.7 Install access doors to open against system air pressure, with latches operable from either side, except outside only where duct is too small for person to enter. Install at fire dampers, smoke dampers, and control dampers. Opening size shall be minimum of 12" x 12" per NFPA 90A for servicing fire and smoke dampers. Provide label with 1-1/2" letters to indicate location of fire protection devices.

- 3.2.8 Install flexible connections in ductwork such that the clear length of the connector is approximately two inches. Provide thrust restraints as required. Flexible material shall not be so slack as to take a definite concave or convex shape during fan operation.

- 3.2.9 Coordinate with other work, including ductwork, as necessary to interface installation of ductwork accessories properly with other work.

- 3.3 Operate installed ductwork accessories to demonstrate compliance with requirements. Test for air leakage while system is operating. Repair or replace faulty accessories as required to obtain proper operation and leakproof performance.

- 3.4 Adjusting And Cleaning:

- 3.4.1 Adjusting: Adjust ductwork accessories for proper settings.
- 3.4.2 Final positioning of manual dampers is specified in Division-15 section "Testing, Adjusting, and Balancing". However, the system shall be left functional with all dampers open or throttled.
- 3.4.3 Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.
- 3.4.4 Furnish extra fusible links to Owner, one link for every 10 installed of each temperature range; obtain receipt.

END OF SECTION 15855.

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## SECTION 15860 - GRILLES, REGISTERS AND CEILING DIFFUSERS

### 1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-15 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of air outlets and inlets work is indicated by drawings and schedules, and by requirements of this section.
- 1.4 Refer to other Division-15 sections for ductwork and duct accessories required in conjunction with air outlets and inlets and for balancing of air outlets and inlets; not work of this section.
- 1.5 Codes and Standards:
- 1.5.1 ADC Compliance: Test and rate air outlets and inlets in certified laboratories under requirements of ADC 1062 "Certification, Rating and Test Manual". Provide air outlets and inlets bearing ADC Certified Rating Seal.
- 1.5.2 NFPA Compliance: Install air outlets and inlets in accordance with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".
- 1.6 Approval Submittals:
- 1.6.1 Product Data: Submit manufacturer's technical product data for air outlets and inlets indicating construction, finish, and mounting details.
- 1.6.2 Performance Data: For each type of air outlet and inlet furnished, provide aspiration ability, temperature and velocity traverses, throw and drop, and noise criteria ratings. Indicate selections and data as required.
- 1.7 O&M Data Submittals: Submit cleaning instructions for finishes and spare parts lists. Include this data and a copy of approval submittals in O&M manual.

### 2 PRODUCTS

- 2.1 General:
- 2.1.1 Except as otherwise indicated, provide manufacturer's standard grilles, registers, and ceiling diffusers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation.
- 2.1.2 Manufacturers not listed in the following specification will not be considered for approval unless accepted by addendum prior to bid.
- 2.1.3 Performance: Provide grilles, registers and ceiling diffusers that have, as minimum, temperature and velocity traverses, throw and drop, and noise criteria ratings for each size device equal to the basis of design.

- 2.1.4 Ceiling and Wall Compatibility: Provide grilles, registers and diffusers with border styles that are compatible with adjacent wall and ceiling systems, and that are specifically manufactured to fit into ceiling module or wall with accurate fit and adequate support. Refer to general construction drawings and specifications for types of ceiling systems and walls which will contain each type of ceiling diffuser, grille, or register.
- 2.1.5 Appearance: All grilles and registers shall be aluminum construction and all diffusers shall be aluminum construction, unless otherwise noted, with uniform matching appearance for each type of outlet. Ceiling mounted grilles and registers shall be set to be sight tight from the predominant exposure.
- 2.1.6 Finish: All ceiling mounted grilles, registers, and diffusers shall be finished with baked white enamel. Wall and door mounted grilles and registers shall be finished with clear anodized finish .
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products by Titus, Price, or Metal Aire.
- 2.3 Rectangular Ceiling Diffusers: Provide rectangular face, adjustable diffuser with removable inner core, no corner joints. If square or rectangular neck is provided, provide square to round adaptor as required. Provide lay-in panel as required. Provide trim ring for diffusers in hard ceilings to allow opening to be used for access.
- 2.4 Return, Exhaust, and Transfer Grilles and Registers: Provide return grilles and registers with one set of 45 degree fixed louvers, parallel to the long dimension. Provide opposed blade damper, screwdriver operated from the face for registers. Provide mounting frame for all wall and plaster ceiling installations.

### 3 EXECUTION

- 3.1 Coordinate installation with ceiling and light fixture installation. Locate ceiling outlets as indicated on architectural Reflected Ceiling Plans. Unless otherwise indicated, locate ceiling outlets in the center of acoustical ceiling modules with sides parallel to the grid.
- 3.2 Install air outlets and inlets in accordance with manufacturer's written instructions and in accordance with recognized industry practices to insure that products serve intended functions.
- 3.3 Coordinate with other work, including ductwork and duct accessories, as necessary to interface installation of air outlets and inlets with other work.
- 3.4 Set air volumes to values shown on the drawings so that the system is functional. Leave ready for test and balance contractor.
- 3.5 Furnish to Owner three operating keys for each type of outlet and inlet that require them; obtain receipt.

END OF SECTION 15860.

## SECTION 15875 - WALL LOUVERS

### 1 GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 Division-23 Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Extent of wall louver work is indicated by drawings and schedules, and by the requirements of this section.

1.4 Refer to other Division-23 sections for ductwork, duct accessories and controls work.

1.5 AMCA Compliance: Test and rate louvers in accordance with AMCA Standard 500. Provide AMCA certified rating seal. Ratings based on tests and procedures performed in accordance with AMCA 500-L and complying with the AMCA 511 Certified Ratings Program. AMCA Certified Ratings Seal applies to air performance, water penetration and wind driven rain ratings.

1.6 Product Qualifications:

1.6.1 Florida Product Approved Louvers:

1. Miami-Dade County, Florida Notice of Acceptance (NOA).
2. Florida Building Code Approval.
3. Louver shall be certified to Florida Building Code Testing Application Standards TAS 100(A) (Wind Driven Rain Resistance), TAS 201 (Large Missile Impact), TAS 202 (Uniform Static Air Pressure) and TAS 203 (Cyclic Wind Loading).
4. AMCA Listed for compliance to AMCA 540 Level E and AMCA 550 standards.

1.6.2 ICC 500 Approved Louvers:

1. FEMA 361
2. ICC 500
3. Louver shall be UL classified wind-storm rated assembly to static and cyclical design pressures of positive/negative 250 psf and debris impact of a 15 lb 2x4 travelling at 100 mph.

1.7 Approval Submittals:

1.7.1 Product data: Submit manufacturer's technical product data for louvers including: model number, accessories furnished, construction, finish, mounting details, performance data.

1.8 O&M Data Submittals: Submit maintenance data, including cleaning of finishes and a copy of approval submittals. Include in O&M manual.

### 2 PRODUCTS

2.1 Acceptable Manufacturers: Subject to compliance with requirements, submit products by

Ruskin, Greenheck, Arrow, American Warming and Ventilating, or AMCA labeled approved equal.

- 2.2 General: Except as otherwise indicated, provide manufacturer's standard louvers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation. Provide Kynar 500 coated, corrosion resistant finish and 5 year warranty; color to be selected by the Owner.
- 2.3 Substrate Compatibility: Provide Florida Product approved louvers with 3-1/8 inch frame and FEMA louvers with 5 inch frame, each with flange and sill extension piece that are compatible with adjacent substrate, and that are specifically manufactured to fit into construction openings with accurate fit and adequate support, for weatherproof installation. Refer to general construction drawings and specifications for types of substrate which will contain each type of louver.
- 2.4 Materials:
- 2.4.1 Florida Product Approved Louvers: Construct of aluminum extrusions, Alloy 6063-T6 0.080" thick for frame and 0.050" thick for blades. Weld units or use stainless steel fasteners.
- 2.4.2 FEMA Louvers: Frame shall be constructed of 1/4" thick aluminum. Blades shall be 1/4" thick, horizontal mounted chevron sight proof, formed aluminum.
- 2.5 Sill Flashing: Formed aluminum, 0.080" thick, upturned sides to prevent water leakage.
- 2.6 Installation Angles: Material: 1.375 x 2.25 inch x 0.125 inch thick continuous aluminum angles around louver perimeter for installation in concrete, deep CMU, steel and wood substrate wall systems.
- 2.7 Installation Plates: Material: 0.250 inch (6.4 mm) thick continuous aluminum flat or zee plates for installation in thin CMU substrate wall systems.
- 2.8 Louver Screens: On inside face of exterior louvers, provide 1/2" square mesh anodized aluminum wire bird screens mounted in removable extruded aluminum frames.
- 2.9 Stationary Florida Product Approved Louvers: Hurricane and impact rated louvers, basis of design is Ruskin EME3625MD.
- 2.10 FEMA Louvers: Wind-storm rated louvers, basis of design is Ruskin XP500.
- 2.11 Performance Data
- 2.11.1 EME3625MD:
1. Performance Ratings: AMCA licensed.
    - a. Based on testing 48 inches x 48 inches size unit in accordance with AMCA 500-L.
  2. Free Area: 53 percent, nominal.
  3. Free Area Size: 8.49 square feet.
  4. Maximum Recommended Air Flow through Free Area: 1,250 feet per minute.
  5. Air Flow: 10,612 cubic feet per minute.
  6. Maximum Pressure Drop (Intake): 0.16 inches w.g..

7. Water Penetration: Beginning point of water penetration of 0.01 ounce per ft<sup>2</sup> of free area shall be above 1,250 feet per minute free area velocity.
8. Wind Load Rating: Maximum wind load of ±150 PSF.
9. AMCA 500-L Wind Driven Rain Performance: 99.5 percent effective at preventing water penetration through louver when tested at 50 miles per hour wind with 8 inches per hour rainfall and 1,675 feet per minute airflow through the free area. Penetration Class 'A' with Discharge Class (Intake) '3' in accordance with AMCA 500-L Wind Driven Rain Test.

2.11.2 XP500:

10. Performance Ratings: AMCA licensed.
  - a. Based on testing 48 inches x 48 inches size unit in accordance with AMCA 500-L.
11. Free Area: 46 percent, nominal.
12. Maximum Recommended Air Flow through Free Area: 900 feet per minute.
13. Air Flow: 7,600 cubic feet per minute.
14. Maximum Pressure Drop (Intake): 0.3 inches w.g..
15. Wind Load Rating: Maximum wind load of ±250 PSF.

3 EXECUTION

- 3.1 Install where shown on the drawings in accordance with the manufacturer's printed instruction and Florida Product Approval. Exercise care to prevent scratches.
- 3.2 Isolate dissimilar metals per the manufacturer's recommendations.
- 3.3 Verify size of louvers shown on drawings prior to fabrication. Coordinate with wall openings. Sizes may be altered subject to approval by Engineer provided free area remains approximately the same as indicated.

END OF SECTION 15875

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## SECTION 15970 - START-UP REQUIREMENTS FOR HVAC SYSTEMS

### 1 GENERAL

1.1 Intent: It is the intent of this section to require that the startup requirements and report noted herein be performed prior to starting TAB work on each system. Work can be phased with permission of the Engineer.

### 1.2 Coordination:

1.2.1 The Contractor shall furnish to the TAB Contractor a complete set of plans, specifications, addenda, shop drawings, equipment performance data sheets, change orders, etc. as requested by the TAB Contractor.

1.2.2 The Contractor shall participate in a TAB coordination meeting to discuss interface requirements with the TAB Contractor and to establish a schedule for TAB work prior to start of TAB work.

### 1.3 Test Reports and Verification Submittals:

1.3.1 Submit Startup Report as described herein for each system. Attach Factory Startup Report for equipment as required by other Division-15 sections.

### 2 PRODUCTS: None

### 3 EXECUTION:

3.1 The TAB work shall not commence until the Engineer has received written notice from the Contractor that HVAC systems are 100% complete and are fully operational. Submit Startup Report as described herein.

3.2 The Contractor shall place all HVAC systems and equipment into complete operation during each working day of TAB work.

3.3 The Contractor shall provide access to HVAC systems and equipment by supplying ladders and/or scaffolding, and opening access panels and equipment room doors.

3.4 The TAB Contractor will provide to the Contractor TAB punch lists of non-complying HVAC work as they are discovered. The Contractor shall replace or repair non-complying work as soon as possible in order not to delay completion of TAB work.

3.5 Airside Systems: The Contractor shall provide the following information to the Engineer to substantiate proper start-up and preliminary adjustments of air handler units, belt driven fans, and duct systems.

3.5.1 Verify that air grilles (supply, return, exhaust, transfer, outdoor, etc.) are installed and connected to the duct system.

3.5.2 Verify that duct systems are clean of debris.

- 3.5.3 Verify that ducts attached with flexible connectors are aligned within ½" and have a uniform gap between ducts of 1"-1.5". Flexible connectors shall not leak and shall be insulated.
- 3.5.4 Verify that filters are clean and filter spacers are installed.
- 3.5.5 Verify that balancing dampers at grilles and branch ducts are operational and are fully opened.
- 3.5.6 Verify that fire and smoke dampers are correctly installed and are fully opened.
- 3.5.7 Verify that fan discharges are appropriate for the outlet ductwork with regards to the "system effect" per AMCA Publication 201. Inappropriate fan discharges will not be accepted.
- 3.5.8 Verify proper fan rotation.
- 3.5.9 Verify proper belt drive alignment.
- 3.5.10 Verify fan motor overload elements are correctly sized.
- 3.5.11 Adjust fan sheave until CFM is at or above design CFM. Provide additional sheaves and belts as required. Verify that motor is not overloaded.
- 3.5.12 Verify that HVAC control systems are fully operational.
- 3.6 Startup Report: The Contractor shall submit the startup information required by this section to the Engineer in a typed report organized as outlined herein. The Startup Report is required to meet the written notice described herein prior to starting TAB work. TAB work will not start until the Startup Report has been submitted and approved.

END OF SECTION 15970.

## SECTION 15985 - TESTING AND BALANCING OF MECHANICAL SYSTEMS

### 1 GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section. Division-15 Basic Mechanical Materials Sections apply to work of this section.

#### 1.2 Description of Work:

1.2.1 Extent of testing, adjusting, and balancing work (TAB) is indicated by requirements of this section, and also by drawings and schedules, and is defined to include, but is not necessarily limited to, air distribution systems, hydronic distribution systems and associated equipment and apparatus of mechanical work. The work consists of setting speed and volume (flow) adjusting facilities provided for systems, recording data, conducting tests, preparing and submitting reports, and recommending modifications to work as required.

1.2.2 Coordination: Coordinate with the General Contractor and Mechanical Contractor responsible for the HVAC system installation as required to complete the TAB work.

1.3 The intent of this specification is to balance HVAC systems within the tolerances listed, maintaining the pressure relationships indicated, with a minimum of noise.

#### 1.3.1 Airflow Tolerances:

1.3.1.1 Air Handling: The supply air, return air and outdoor air quantities shall be balanced within  $\pm 5\%$  of design values.

1.3.1.2 Exhaust Fans: The exhaust fan quantities shall be set as required to maintain the design exhaust terminal flows within  $\pm 5\%$  of design values. If no exhaust terminals exist, exhaust fan air quantities shall be balanced within  $\pm 10\%$  of design values.

1.3.1.3 Ceiling Diffusers, Supply Registers, Return and Exhaust Inlets: Balance to an air quantity within  $\pm 10\%$  of the design values.

#### 1.3.2 Temperature Tolerances:

1.3.2.1 Air Handling Temperatures: The controlled temperatures at AHUs shall be verified to be under control within  $\pm 1^\circ\text{F}$  of design values.

1.3.2.2 Room Temperatures: Balance systems and controls within  $\pm 2^\circ\text{F}$  of indicated settings.

1.4 Quality Assurance: The TAB Contractor shall be certified as one of the following:

1.4.1 Tester: A firm certified by National Environmental Balancing Bureau (NEBB) in those testing and balancing disciplines required for this project, who is not the Installer of the systems to be tested and is otherwise independent of the project. Comply with NEBB's "Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems" as applicable to this work.

- 1.4.2 Tester: A firm certified by Associated Air Balance Council (AABC) in those testing and balancing disciplines required for this project. AABC-certified firms are independent by definition. Comply with AABC's Manual MN-1 "AABC National Standards", as applicable to this work.
- 1.4.3 Industry Standards: Comply with American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) recommendations pertaining to measurements, instruments and testing, adjusting and balancing, except as otherwise indicated.
- 1.5 Job Conditions:
- 1.5.1 Do not proceed with testing, adjusting, and balancing work until HVAC work (including Controls) has been completed and is operable. Ensure that there is no residual work still to be completed.
- 1.5.2 Do not proceed until work scheduled for testing, adjusting, and balancing is clean and free from debris, dirt and discarded building materials.
- 1.5.3 Do not proceed until architectural work that would affect balancing (walls, ceiling, windows, doors) have been installed.
- 1.5.4 Testing may proceed system by system, but each HVAC system must be complete as describe herein.
- 1.5.5 The mechanical contractor shall make any changes in pulleys, belts, and dampers, and/or add dampers as required for correct balancing.
- 1.6 Approval Submittals
- 1.6.1 Submit the name of the proposed test and balance company for the Engineer's approval within thirty (30) days after awarding of contract.
- 1.7 Test Reports and Verification Submittals:
- 1.7.1 Submit four (4) copies of the dated test and balance report upon completion of TAB work. The report shall include a list of instruments used for the work. The report shall be signed by the supervisor who performed the TAB work.
- 2 PRODUCTS
- 2.1 Patching Materials: Except as otherwise indicated, use same products as used by original Installer for patching holes in insulation, ductwork and housings which have been cut or drilled for test purposes, including access for test instruments, attaching jigs, and similar purposes.
- 2.2 Test Instruments: Utilize test instruments and equipment of the type, precision, and capacity as recommended in the referenced standard. All instruments shall be in good condition and shall have been calibrated within the previous six (6) months (or more recently if required by standard).
- 3 EXECUTION

- 3.1 General:
- 3.1.1 Examine installed work and conditions under which testing is to be done to ensure that work has been completed, cleaned and is operable. Do not proceed with TAB work until unsatisfactory conditions have been corrected in manner acceptable to Tester.
- 3.1.2 Test, adjust and balance environmental systems and components, as indicated, in accordance with procedures outlined in applicable standards, and as modified or detailed herein.
- 3.1.3 Test, adjust and balance systems during summer season for air conditioning systems and during winter season for heating systems, including at least a period of operation at outside conditions within 5°F wet bulb temperature of maximum summer design condition, and within 10°F dry bulb temperature of minimum winter design condition. When seasonal operation does not permit measuring final temperatures, then take final temperature readings when seasonal operation does permit. The Contractor shall return for a change of seasons test at no additional cost to the Owner and submit the revised TAB report.
- 3.1.4 Punch List: Prepare a deficiency (punch)list for the Contractor with a copy of the Engineer that lists all items that are incorrectly installed or are functioning improperly. Provide a retest after all items are corrected.
- 3.1.5 Prepare TAB report of test results, including instrumentation calibration reports, in format recommended by applicable standards, modified as required to include all data listed herein.
- 3.1.6 Patch holes in insulation, ductwork and housings, which have been cut or drilled for test purposes, in manner recommended by original Installer.
- 3.1.7 Mark equipment settings, including damper control positions, valve indicators, fan speed control levers, and similar controls and devices, to show final settings at completion of TAB work. Provide markings with paint or other suitable permanent identification materials.
- 3.1.8 Include in the TAB report recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced.
- 3.1.9 Include an extended warranty of ninety (90) days after completion of test and balance work, during which time the Engineer, at his discretion, may request a recheck, or resetting of any component as listed in test report. The TAB company shall provide technicians and instruments and make any tests required by the Engineer during this time period.
- 3.2 Controls
- 3.2.1 Check all HVAC controls for proper location, calibration and sequence of operation.
- 3.2.2 Check operation of all controllers and controlled devices to verify proper action and direction. Check the operation of all interlocks.
- 3.3 Air Balancing
- 3.3.1 Leakage tests on ductwork must have been completed before air balancing.
- 3.3.2 Set dampers, volume controls and fan speeds to obtain specified air delivery with minimum

- noise level. Rebalance as required to accomplish this. Simulate fully loaded filters during test.
- 3.3.3 Set grille deflections as noted on plans. Modify deflections if required to eliminate drafts or objectionable air movement.
- 3.3.4 Record air terminal velocity after completion of balance work.
- 3.3.5 Record final grille and register deflection settings if different from that specified on contract drawings.
- 3.3.6 Record all fan speeds.
- 3.4 Data Collection:
- 3.4.1 In addition to the data required for any specified performance tests, measure and record the temperatures, pressures, flow rates, and nameplate data for all components listed herein.
- 3.4.2 It is the intent of this section to record data on balanced systems, under normal operating or design conditions.
- 3.4.3 Temperatures:
1. Outside dry and wet bulb temperatures.
  2. Dry bulb temperature in each room and at least one wet bulb temperature in each zone.
  3. Refrigerant liquid and suction temperatures.
  4. Inlet and outlet temperature of each heat exchange device - both fluids.
- 3.4.4 Pressures:
1. Suction and discharge static pressure of each fan.
  2. Suction and discharge pressure of each pump.
  3. Each refrigerant suction and discharge pressure.
- 3.4.5 Flow rates:
1. Flow rate through each fan.
- 3.4.6 Nameplate Data:
1. Complete nameplate data for all equipment.
  2. Motor data to include horsepower, phase, voltage, RPM, full load nameplate current, fuse rating in disconnect switch, number or manufacturer's size designation, and ampere rating of overcurrent and low voltage protection devices in starters.
- 3.5 All test openings in ductwork shall be resealed in an approved manner.

END OF SECTION 15985.

## SECTION 16000 - ELECTRICAL GENERAL REQUIREMENTS

### 1.0 GENERAL

#### 1.01 SECTION INCLUDES:

- A. Electrical General Requirements specifically applicable to Division 16 Sections, in addition to Division 1 - General Requirements.

#### 1.02 PROJECT/SITE CONDITIONS:

- A. Install work in locations shown on Drawings, unless prevented by project conditions.
- B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other Sections. Obtain permission of Engineer before proceeding.
- C. Before submitting a proposal for the work contemplated in these specifications and accompanying Drawings, each bidder shall examine the site and familiarize himself with all the existing conditions and limitations. No additional compensation will be allowed because of the Contractor's misunderstandings as to the amount of work involved or his lack of knowledge of any condition in connection with the work.

#### 1.03 REGULATORY REQUIREMENTS:

- A. Permits and Inspections: This Contractor shall secure and pay for all permits, and inspections required on work performed under this section of the Specifications. He shall assume full responsibility for all assessments and taxes necessary for the completion and acceptance of the work.
- B. Applicable Standards and Codes: All materials and workmanship shall comply with all applicable codes, specifications, local ordinances, industry standards and utility company regulations. In case of difference between building codes, specifications, federal and state laws, local ordinances, industry standards and utility company regulations and the Contract Documents, the most stringent requirements shall govern. The Contractor shall promptly notify the Engineer in writing of such differences. Should the Contractor perform any work that does not comply with the requirements of the applicable building codes, federal and state laws, local ordinances, industry standards and utility company regulations, he shall bear all costs arising in correcting the deficiencies. Applicable codes and standards shall include all State laws, State Board of Health and State Rating Bureau, local ordinances, utility company regulations and the applicable requirements of the following:
  - 1. Standard Building Code
  - 2. National Fire Protection Association - NFPA
  - 3. National Electrical Manufacturers Association - NEMA
  - 4. National Bureau of Standards
  - 5. American National Standards Institute - ANSI
  - 6. Underwriters' Laboratories – UL

#### 1.04 COOPERATION:

- A. Cooperate with others in laying out the electrical work so that this phase of the work will properly fit the building and other contractor's requirements.

1.05 PRODUCTS FURNISHED BY OTHERS:

- A. Products are furnished by the Owner or under other Divisions of these Specifications that require electrical connection. This Contractor shall provide all necessary materials and labor to connect to the electrical system all equipment and fixtures having electrical power connection requirements. Refer to other Divisions of these Specifications for additional or specific requirements. Actual rough-in dimensions shall be obtained from Shop Drawings or measurements of the equipment or fixture.
- B. The unpacking, assembling and setting of equipment furnished by the Owner or under other Divisions of these Specifications will be performed by others, unless stated otherwise.
- C. Because the manufacturer of the equipment actually purchased or supplied may vary slightly from that specified, as hereinbefore stated, some rearranging of the requirements may be necessary. This Contractor shall make connections as required by the actual equipment furnished.

1.06 SEQUENCING AND SCHEDULING:

- A. Construct work in sequence under provisions of applicable sections of these specifications.
- B. Power outages shall be scheduled with the Owner and other Contractors. Outages shall be at the convenience of the Owner.

1.07 APPROVAL OF MATERIALS AND EQUIPMENT:

- A. Whenever a material, article, or piece of equipment is identified on the Drawings or in these Specifications by reference to manufacturer's or vendor's name, trade name, catalog number or the like, it is so identified for the purpose of establishing a standard of quality and shall not be construed as limiting competition. Any material, article, or piece of equipment of other manufacturers or vendors, which will perform adequately the intent of the design, will be considered equally acceptable provided written approval has been granted by the Engineer. Materials submitted for approval shall comply with all applicable Sections of these Specifications prior to acceptance. Submit proposed substitutions to the Architect for approval at least ten (10) days prior to the bid so that an addendum can be issued to all contractors. Engineer's opinion shall be final on the equality of substituted items.
- B. After the Contract has been awarded, catalog cuts on the following items shall be submitted to the Architect/Engineer for final approval before purchase of the equipment whether substitutions are being made or not:
  - 1. Light Fixtures
  - 2. Panelboards and Switchboards
  - 3. Distribution Equipment
  - 4. Wiring Devices
  - 5. Fabricated Equipment
  - 6. Automatic Transfer Switches

1.08 OBSERVATION, TESTING AND BALANCING:

- A. Observation: The complete job will be, during and/or after construction, subject to the administration of the Engineer. Site visits shall be conducted by the Architect/Engineer or his designated representative as necessary to maintain compliance with the Contract requirements.
- B. Testing: Prior to acceptance by the Owner/Engineer, the Contractor shall conduct and record insulation tests of all feeder and motor branch circuits. The insulation testing shall be accomplished utilizing an meg-ohm meter. Verification of test results shall be witnessed by the Architect or his designated representative. The

Contractor shall submit a written report of all readings of each feeder and circuit.

- C. Balancing: All branch circuits and feeders shall be tested under maximum and typical load conditions, and loads shall be balanced on the phases of the electrical system. The Contractor shall submit written report of final load readings of all loads on each feeder.

#### 1.09 WORKMANSHIP:

- A. All work shall be executed in a neat and substantial manner by skilled workman, well qualified, and regularly engaged in the type of work required. Substandard work shall be removed and replaced by the Contractor at no cost to the Owner.

#### 1.10 OPERATING AND MAINTENANCE INSTRUCTIONS/AS BUILT DRAWINGS:

- A. Four (4) complete sets of instructions containing the manufacturer's operating and maintenance instructions for each piece of equipment shall be furnished to the Owner. Each set shall be permanently bound and shall have a hard cover. One complete set shall be furnished at the time that the test procedure is submitted, and remaining sets shall be furnished before the Contract is completed. Flysheets shall be placed before instructions covering each subject. The instruction sheets shall be approximately 8-1/2" by 11" with large sheets of Drawings folded in. The instructions shall include information for major pieces of equipment and systems.
- B. Upon completion of the work and at the time designated, the services of one project engineer shall be provided by the Contractor to instruct the representative of the Owner in the operation and maintenance of the systems.
- C. This Contractor shall provide as-built Drawings at the completion of the job. Drawings shall show all significant changes in equipment, wiring, routing, location, etc.

#### 1.11 GUARANTEE:

- A. This Contractor shall guarantee to the Owner, all work performed under this contract to be free from defects in workmanship and material for a period of one year from date of final acceptance by Owner and Architect. Any defects arising during this period will be promptly remedied by the Contractor without cost to the Owner. Lamps and fuses burned out during normal operation after acceptance are exempt from guarantee. This Contractor shall furnish the Owner with an estimated time, from notification of a problem to presence on the site, for all service calls on warranty items.

#### 1.12 COMPLIANCE:

- A. In the event of a conflict between Specifications, Drawings, Codes, Requirements, etc., the most

stringent requirements shall govern.

- B. The interpretation of conflicts and resolution thereof shall remain the right of the Architect/Engineer or his designated representative.

PART 2 - PRODUCTS: Not Used

PART 3 - EXECUTION: Not Used

**End of Section**

## SECTION 16100 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS, CABLES, AND DEVICES

### 1.0 GENERAL

#### 1.01 RELATED DOCUMENTS:

- A. Section 16000 - Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

#### 1.02 SECTION INCLUDES:

- A. Wire and Cable
- B. Wiring Devices

### 2.0 PRODUCTS

#### 2.01 WIRE AND CABLE

##### A. Building Wire:

1. Feeder and Branch Circuits 10 AWG and Smaller: Copper, solid conductor, 600 volt insulation, rated 75 degrees C, THHN/THWN.
2. Feeder and Branch Circuits 8 AWG and 6 AWG: Copper, stranded conductor, 600 volt insulation, rated 75 degrees C, THHN/THWN.
3. Feeder and Branch Circuits Larger Than 6 AWG: Copper, stranded conductor, 600 volt insulation, rated 75 degrees C, THW.
4. Control Circuits: Copper, stranded conductor, 600 volt insulation, THHN/THWN.

**NOTE: The use of Romex cable is not allowed on this project. Aluminum wire may be used for feeder conductors provided the local AHJ and owner approves and the minimal allowable ampacity (as specified) is met. 'MC' cable allowed for connection to light fixtures above accessible ceilings with a maximum length of 6'. In order to save costs, 'MC' cable allowed in concealed spaces where not likely to be damaged provided owner approval is obtained.**

##### B. Remote Control Signal Cable (where applicable):

1. Control Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600 volt insulation, rated 60 degree C, individual conductors twisted together, shielded, and covered with PVC jacket.
2. Control Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volt insulation, rated 60 degree C, individual conductors twisted together, shielded, and covered with PVC jacket; UL listed.

- C. Cords: Oil-resistant thermoset-insulated multi-conductor flexible cord with identified equipment grounding conductor, suitable for extra hard usage in damp locations, type SO.

## 2.02 WIRING DEVICES AND WALL PLATES:

- A. Manufacturers:
  - 1. Hubbell
  - 2. Leviton
  - 3. Arrow Hart
- B. Wall Switches: AC general use, quiet-operating snap switch rated 20 amperes and 120/277 volts AC, with plastic toggle handle, ivory color.
  - 1. Single Pole Switch: Hubbell 1221-I
  - 2. Three Way Switch: Hubbell 1223-I
- C. Receptacle:
  - 1. Convenience Receptacle Configuration: Type 5-20R, plastic face, **ivory color**. Model 5262-I manufactured by Hubbell.
  - 2. Specific Purpose Receptacle: Configuration indicated on Drawings with black plastic face.
  - 3. Provide straight-blade receptacles to NEMA WD 1.
  - 4. Provide straight-blade receptacles to NEMA WD 5.
  - 5. GFCI Receptacles: Duplex convenience receptacle with integral ground fault current interrupter. Model GFR-5352IA manufactured by Hubbell. Device shall be compliant to the requirements of UL 943.
- D. Wall Dimmer: Rotary dial or slide type, **color by architect**. Model C-2000 manufactured by Lutron.(or Leviton equal) Rating of 2000 watts at 120 volts, AC.
- E. Decorative Cover Plate: Smooth Stainless steel, **color by architect**, ANSI 302.
- F. Weatherproof Cover Plate: Gasketed cast metal with hinged gasketed device covers **rated raintight while in use** in accordance with Article 410-57 of the National Electrical Code.
- G. Attachment Plug Cap: Match receptacle configuration provided for equipment connection.
- H. Cord Reels: Provide cord reels as indicated on the drawings. Cords shall be sized per loads served and shall be 50' in length.

## 3.0 EXECUTION

### 3.01 EXAMINATION AND PREPARATION:

- A. Verify that interior of building has been physically protected from weather.

- B. Verify that mechanical work which is likely to injure conductors has been completed.
- C. Completely and thoroughly swab raceway system before installing conductors.

### 3.02 INSTALLATION:

#### A. Wiring Methods:

1. Concealed Interior Locations: Building wire in raceway.
2. Exposed Interior Locations: Building wire in raceway.
3. Above Accessible Ceilings: Building wire in raceway.
4. Wet or Damp Interior Locations: Building wire in raceway.
5. Exterior Locations: Building wire in raceway.
6. Underground Locations: Building wire in raceway.
7. Hazardous Locations: Building wire in raceway conforming to applicable NEC Articles as identified on the Drawings.

B. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 14 AWG for control wiring. Conductors shall be sized to compensate for voltage drop.

C. Neatly train and secure wiring inside boxes, equipment and panelboards.

D. Use UL listed wire pulling lubricant for pulling conductors in raceways.

E. Make splices, taps, and terminations to carry full ampacity of conductors without perceptible temperature rise.

F. Devices shall mount flush or as indicated on the Drawings.

G. Install wiring devices in accordance with manufacturer's instructions.

1. Install wall switches 48 inches above floor, "OFF" position down.
2. Install wall dimmers 48 inches above floor. De-rate ganged dimmers as instructed by manufacturer. Do not use a common neutral, provide a separate neutral for each dimmed circuit.
3. Unless noted otherwise, install convenience receptacles 18 inches above floor, 6 inches above counters or splashbacks, with grounding pole on bottom.
4. Install GFCI receptacles at all outdoor locations and all indoor locations as required by NFPA70, and as indicated.
5. Install specific purpose receptacles at heights shown on Drawings.

6. Install cord and attachment plug caps on equipment under the provisions of Section 16100. Size cord for connected load and rating of branch circuit over-current protection.
- K. Install wall plates flush and level.
1. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
  2. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
  3. Install weatherproof coverplates on all devices/boxes in wet or outdoor locations.

3.03 FIELD QUALITY CONTROL:

- A. Perform field inspection and testing of circuits under provisions of Section 16000.
1. Inspect wire and cables for physical damage and proper connection.
  2. Torque test conductor connections and terminations to manufacturer's recommended values.
  3. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

**END OF SECTION**

## SECTION 16200 - RACEWAY SYSTEMS

### 1.0 GENERAL

#### 1.01 RELATED DOCUMENTS:

- A. Section 16000 - Electrical General Requirements, apply to the work specified in this section, with additions and modifications specified herein.

#### 1.02 SECTION INCLUDES:

- A. Conduit and Conduit Fittings
- B. Electrical Boxes and Fittings
- C. Cable Tray

### 2.0 PRODUCTS

#### 2.01 CONDUIT AND FITTINGS:

##### A. Conduit:

1. Metal Rigid Conduit: Galvanized steel.
2. Metal Tubing: Galvanized steel.
3. Flexible Conduit: Steel.
4. Liquid-Tight Flexible Conduit: Flexible conduit with PVC Jacket.
5. Plastic Conduit and Tubing: NEMA TC 2; PVC. Use Schedule 40 conduit.

##### B. Conduit and Fittings:

1. Conduit Fittings and Conduit Bodies: NEMA FB 1. Conduit fittings to be steel, threaded type. Split couplings are not acceptable.
2. Tubing Fittings: NEMA FB 1. Tubing fittings to be steel compression type for conduit up to 2" in diameter and set screw type for conduit 2-1/2" and larger.
3. Flexible Conduit Fittings: NEMA FB 1. Flexible conduit fittings to be steel set screw or screw in type.
4. Liquid-Type Flexible Conduit Fittings: NEMA FB 1. Liquid-tight flexible conduit fittings to be steel compression type.
5. Plastic Fittings and Conduit Bodies: NEMA TC 3.

#### 2.02 ELECTRICAL BOXES:

A. Boxes:

1. Sheet Metal: NEMA OS 1; galvanized steel, 4" or 4-11/16" square. Provide galvanized plaster/tile ring for recessed outlet boxes.
2. Cast Metal: Aluminum or cast ferrous alloy, deep type, gasketed cover, threaded hubs.
3. Nonmetallic: NEMA OS 2.

B. Large Enclosures: NEMA 250; Type 4, steel enclosures with manufacturer's standard enamel finish and cover, held closed screws.

2.03.1 CABLE TRAY (where applicable):

A. Manufacturers:

1. B-line
2. Mono-Systems

B. Ladder type, constructed of aluminum with 9" rung spacing, 6" siderails and 18" wide

C. Fittings: Horizontal 90° elbows, horizontal tees, and horizontal crosses with all metal accessories to connect to straight sections.

D. Support: Supports shall be fabricated channel, and threaded rods.

E. Grounding: Provide grounding straps as each junction, splice, fitting, etc.

3.0 EXECUTION

3.01 EXAMINATION AND PREPARATION:

- A. Examine supporting surfaces to determine that surfaces are ready to receive work.
- B. Electrical boxes shown on Contract Drawings are approximate locations unless dimensioned.

3.02 INSTALLATION:

A. Use conduit and tubing for raceways in the following locations:

1. Underground Installations: Rigid steel conduit, painted with two coats of epoxy asphaltum paint, or Schedule 40 PVC conduit.
2. Installations In Concrete: Rigid steel conduit, or Schedule 40 PVC conduit.
3. In Slab Above Grade: Rigid steel conduit, or Schedule 40 PVC conduit. Where likely to be damaged, use Schedule 80 PVC in lieu of Schedule 40 PVC.
4. Exposed Outdoor Locations: Rigid steel conduit or Schedule 40 PVC. Schedule 80 PVC to

be used in areas prone to damage.

5. Wet Interior Locations: Rigid steel conduit or electrical metallic tubing. Use threaded or raintight fittings for conduit.
6. Concealed Dry Interior Locations: Rigid steel conduit or electrical metallic tubing.
7. Exposed Dry Interior Locations: Rigid steel conduit or electrical metallic tubing.
8. Feeders: Galvanized rigid steel conduit and PVC conduit on all feeders. Schedule 40 PVC may be used in environments where there is an unlikely probability that the conduit will be damaged. Otherwise, use schedule 80 PVC if RMC is not used.

B. Size raceways for conductor type installed.

1. Minimum Size Conduit: 1/2 inch.

C. Arrange conduit and tubing to maintain headroom and to present a neat mechanical appearance.

1. Route exposed raceway parallel and perpendicular to walls and adjacent piping.
2. Maintain minimum 6 inch clearance to piping and 12 inch clearance to heat surfaces such as flues, piping, and heating appliances.
3. Maintain required fire, acoustic, and vapor barrier rating when penetrating walls, floors, and ceilings.
4. Route conduit through roof openings for piping and ductwork where possible; otherwise, route through roof jack with pitch pocket.
5. Group in parallel runs where practical. Use rack constructed of steel channel. Maintain spacing between raceways or de-rate circuit ampacities to NFPA 70 requirements.
6. Use approved manufactured conduit hangers and clamps; do not fasten with wire or perforated pipe straps. Utilize conduit hangers for conduits located below floor slabs.
7. Use conduit bodies to make sharp changes in direction.
8. Terminate all conduits with insulated bushings.
9. Use suitable caps to protect installed raceway against entrance of moisture and dirt.
10. Provide a pull string in all empty raceways.
11. Install expansion joints fittings where raceway crosses building expansion joints.
12. Install plastic conduit and tubing in strict accordance with the manufacturer's recommendations. When plastic conduit is installed, use galvanized rigid elbows for 90E bends.

D. Install electrical boxes as shown on the Drawings, and as required for splices, taps, wire pulling,

equipment connections and regulatory requirements.

1. Use cast outlet box in exterior locations, wet locations, and exposed interior locations.
  2. Use large enclosure for interior pull and junction boxes larger than 12 inches in any dimension.
  3. Locate and install electrical boxes to allow access. Provide access panels if required.
  4. Locate and install electrical boxes to maintain headroom and to present a neat mechanical appearance.
  5. Install pull boxes and junction boxes above accessible ceilings or in unfinished areas.
  6. Provide knockout closure for unused openings.
  7. Align wall-mounted outlet boxes plumb and level for switches, and similar devices.
  8. Coordinate mounting heights and locations of outlets above counters and backsplashes.
  9. Install lighting outlets to locate luminaires as shown on the Drawings.
- E. Use recessed outlet boxes in finished areas where indicated.
1. Secure boxes to interior wall and partition studs, accurately positioning to allow for surface finish thickness, and plaster/tile ring installation.
  2. Use stamped steel stud bridges for flush outlets in hollow stud wall, and adjustable steel channel fasteners for flush ceiling outlet boxes.
  3. Locate boxes in masonry walls to require cutting corner only. Coordinate masonry cutting to achieve neat openings for boxes.
  4. Do not install boxes back-to-back in walls; provide 6 inch separation, minimum. In acoustic-rated walls provide 24 inch separation minimum.
  5. Do not damage insulation.

**END OF SECTION**

## SECTION 16300 - SERVICE AND DISTRIBUTION

### 1.0 GENERAL

#### 1.01 RELATED DOCUMENTS:

- A. Section 16000 - Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

#### 1.02 SECTION INCLUDES:

- A. System Description
- B. Utility Requirements
- C. Grounding
- D. Switchboards
- E. Panelboards
- F. Enclosed Switches
- G. Fuses
- H. Transformers
- I. Enclosed Circuit Breakers
- J. Plug-in Duct

#### 1.03 SYSTEM DESCRIPTION:

- A. The new 120/240V volts, single phase, three wire, 60 Hz fed will be fed via an underground feeder from a new onsite generator/ATS system by others. EC only responsible for installing exterior main panel and conduit to grade for the feeder. Feeder to be furnished/installed by others. Electrical drawings to override specifications when determining size and type of service to be installed.

#### 1.04 PROJECT CONDITIONS:

- A. Verify field measurements for the equipment to ensure proper fit within the space proposed.

#### 1.05 UTILITY REQUIREMENTS:

- A. The serving utility is **FP&L**.
- B. Metering shall be provided by the utility company and installed by the electrical contractor.

## 2.0 PRODUCTS

### 2.01 SWITCHBOARD:

#### A. Manufacturers:

1. Square D Company
2. Cutler-Hammer
3. Siemens
4. General Electric

#### B. Switchboard: NEMA PB2.

1. Line and Load Terminations: Accessible from front only of switchboard, suitable for conductor materials used.
2. Main Sections Devices: Individually mounted.

#### C. Ratings: As shown on Drawings.

#### D. Bussing:

1. Bus Material: Copper or Aluminum with tin plating sized in accordance with NEMA PB2.
2. Bus Connections: Accessible from front for maintenance.
3. Ground Bus: Copper

#### E. Enclosure: Type 1 General purpose as shown on the Drawings.

1. Align sections at front and rear.
2. Height: 90 inches
3. Finish: Manufacturer's standard light gray enamel over external surfaces.

#### F. Future Provisions:

1. Fully equip spaces for future devices with bussing and bus connection provisions; continuous current rating as indicated on the Drawings.
2. Do not taper main bus rating.

#### G. Switching and Over-Current Protection Devices:

1. Molded Case Circuit Breakers: NEMA AB 1.
2. Solid State Molded Case Circuit Breakers: NEMA AB 1; with electronic sensing, timing and tripping circuits for adjustable current settings; ground fault trip; instantaneous trip and adjustable short time trip.

H. Switchboard Instruments:

1. Ground Fault Sensors: Zero sequence type.
2. Ground Fault Relay: Adjustable ground fault sensitivity from 200 to 1200 amperes, time delay adjustable from 0 to 1 second.
3. Square D Power Logic metering.

2.02 PANELBOARDS:

A. Manufacturers:

1. Square D Company Only...No Equals Accepted!

B. Distribution Panelboards: NEMA PB 1; circuit breaker type.

1. Enclosures: Type 1 or 3R as shown on Drawings.
2. Mounting: Surface or flush mount as shown on Drawings.
3. Bus: Copper.
4. Ground Bus: Copper
5. Voltage and phase: As shown on Drawings.
6. Minimum Integrated Equipment: As shown on Drawings.
7. Hinged door with lock.
8. Circuit Breakers: Bolt-on, ratings as shown on Drawings.

C. Light and Power Panelboards: NEMA PB 1; circuit breaker type.

1. Enclosures: Type 1 or 3R as shown on Drawings.
2. Surface or flush mount as shown on Drawings.
3. Bus: Copper.
4. Ground Bus: Copper.
5. Voltage and phase as shown on Drawings.

- 6. Minimum Integrated Equipment: As shown on Drawings.
  - 7. Hinged door with lock.
  - 8. Circuit Breakers: Bolt-on, ratings as shown on Drawings.
- D. Accessories: Provide panel and branch device accessories as shown on Drawings.
  - E. Future Provisions: Where space provisions are indicated on the Drawings provide bussing, bus extensions, etc. require to mount future circuit breakers. Where spare provisions are indicated on the Drawings provide circuit breakers complete and ready for connection.
- 2.03 ENCLOSED SWITCHES:
- A. Manufacturers:
    - 1. Square D Company only...No Equals Accepted!
  - B. Enclosed Switch Assemblies: NEMA KS 1; Type HD.
    - 1. Fuse Clips: Designed to accommodate Class `R' or `J' fuses as shown on Drawings.
  - C. Enclosures: NEMA KS 1; Type 1, 3R, and 4X as required.
  - D. Ground: Provide grounding lug.
  - E. Ratings: 600 or 250 volts to match system service requirements, poles and ampere ratings as indicated on the Drawings.
- 2.04 FUSES:
- A. Manufacturers:
    - 1. Bussman
    - 2. Shawmut
    - 3. Little Fuse
  - B. Service Entrance/Feeder Circuits-601 Amp and Larger
    - 1. Current Limiting
    - 2. UL Class L
    - 3. 200,000 Ampere RMS Interrupting Rating
    - 4. Voltage Rating: As required for system compatibility.
  - C. Service Entrance/Feeder Circuits-600 Amp and Smaller

1. Current Limiting
2. UL Class RK1
3. 200,000 Ampere RMS Interrupting Rating
4. Voltage Rating: As required for system compatibility

D. Motor, Motor Controller, Transformer and Inductive Circuits

1. Current Limiting
2. UL Class RK1, Time Delay
3. 200,000 Ampere RMS Interrupting Rating
4. Voltage Rating: As required for system compatibility.

2.05 TRANSFORMERS:

A. Manufacturers:

1. Square D Company
2. ITE-Siemens
3. General Electric Company
4. Cutler Hammer

B. Description: Enclosed air-cooled dry type transformer.

C. Ratings:

1. Primary Voltage: As shown on Drawings.
2. Secondary Voltage: As shown on Drawings.
3. Capacity: KVA ratings as shown on Drawings.
4. Basic Impulse Level: 10 BIL.
5. Insulation Class/Temperature Rise: Class 220/115 degrees C.

D. Configuration: Two winding, delta-wye.

E. Winding Taps: Four full capacity primary taps, each at 2.5 percent below rated voltage; and two

full capacity primary taps, each at 2.5 percent above rated voltage.

- F. Mounting: Wall, floor, or trapeze as shown on Drawings.
- G. Enclosures: Code gauge steel, NEMA 1 or 3R as required.

## 2.06 ENCLOSED CIRCUIT BREAKERS:

### A. Manufacturers:

- 1. Square D Company only...No Equals Accepted!

### B. Circuit Breaker: NEMA AB 1.

- 1. Voltage: As shown on Drawings.
- 2. Enclosure: NEMA AB 1; Type 1 or 3R as required.
- 3. Accessories: As indicated on Drawings.

## 2.07.1 PLUG-IN DUCT

### A. Manufacturers:

- 1. Square D Company
- 2. ITE-Siemens
- 3. General Electric
- 4. Cutler Hammer

### B. Plug-in Duct

- 1. Bus Material: Copper
- 2. Enclosure: NEMA 1
- 3. Mounting: Suspended from structure
- 4. Rating: 225 amperes, 600 volt, 3 phase, 4 wire

### C. Plug-in Units

- 1. Fusible switches

## 3.0 EXECUTION

### 3.01 EXAMINATION AND PREPARATION:

- A. Make arrangements with utility company to obtain permanent electrical service to the facility.

3.02 INSTALLATION:

- A. Install utility services in accordance with utility company standards and requirements.
  - 1. Underground Service: Refer to 'Power Riser Diagram' for details. (Verify with utility prior to bid/construction.)
- B. Install equipment in accordance with manufacturer's instructions.
- C. Install switchboard to NEMA PB 2.1.
- D. Install panelboards to NEMA PB 1.1.
- E. Ground the electrical service in accordance with NFPA 70, National Electrical Code, Article 250.
- F. Provide labels for all switchboards, panelboards, and distribution equipment.
- G. Provide typewritten directory inside panel door for all panelboards.

**END OF SECTION**

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## SECTION 16400 - BASIC ELECTRICAL MATERIALS AND METHODS

### 1.0 GENERAL

#### 1.01 RELATED DOCUMENTS:

- A. Section 16000 - Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

#### 1.02 SECTION INCLUDES:

- A. Grounding and Bonding
- B. Supports
- C. Identification
- D. Connection of Equipment
- E. Excavation, Trenching, and Backfilling
- F. Cleaning and Painting
- G. Cutting and Patching

#### 1.03 PROJECT CONDITIONS:

- A. Existing project conditions indicated on Drawings are based on casual field observation and existing record documents.
- B. Verify field measurements and circuiting arrangements as shown on the Drawings.
- C. Report discrepancies to Engineer before disturbing existing installation.

### 2.0 PRODUCTS

#### 2.01 GROUNDING MATERIALS:

- A. Ground Rod: Copper clad steel, 3/4 inch in diameter x 10 feet in length.
- B. Mechanical Connectors: Cast bronze construction with matching bolt, nuts, and washers.
- C. Exothermic Welds: Materials shall be from the same source. Materials shall be Cadweld or approved equal.
- D. Conductors: Insulated type complying with applicable Sections of these Specifications or bare soft drawn copper as indicated.

#### 2.02 SUPPORTS:

- A. Fabrication Steel: Galvanized or painted steel of standard shapes and sizes.
- B. Manufactured Channel: Hot dipped galvanized with all hardware required for mounting as manufactured by Unistrut, Kindorf, or Powerstrut.
- C. Miscellaneous Hardware: Standard sizes treated for corrosion resistance.

#### 2.03 IDENTIFICATION:

- A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.
- B. Wire and Cable Markers: Cloth type, split sleeve type, or tubing type.
- C. Panel Directories: Typewritten under plastic cover.

### 3.0 EXECUTION

#### 3.01 INSTALLATION:

- A. Install Products in accordance with manufacturer's instructions.
- B. Except where specifically indicated otherwise, all exposed non-current-carrying metallic parts of electrical equipment, metallic raceway systems, and service neutral of the electrical system shall be grounded.
  - 1. Equipment grounding shall be accomplished by installing a separate grounding conductor in each raceway of the system. The Conductor shall be provided with a distinctive green insulation or marker and shall be sized in accordance with Table 250-122 of the National Electrical Code for circuit ampacity ratings.
  - 2. The electrical system grounding electrode shall be made at the main service equipment and shall be extended to the point of entrance of the metallic cold water service. Ground to be sized in accordance with Table 250-66 of the National Electrical Code. Connection to the water pipe shall be made by a suitable ground clamp. If flanged pipes are encountered, connection shall be made on the street side of the flange connection. If the metallic water service is coated with an insulating material or there is no metallic water service to the building, ground connection shall be made to ground rods at the exterior of the building driven full length into the earth. The maximum resistance of the driven ground shall not exceed 25 ohms under normally dry conditions. If this resistance cannot be obtained with a single rod, additional rods shall be installed not less than 6 feet on centers, or if sectional type rods are used, additional sections may be coupled together and driven with the first rod. The resultant resistance shall not exceed 25 ohms measured not less than 48 hours after rainfall.
  - 3. Ground all building steel including reinforcing bars in concrete and all piping entering the building from outside. Where applicable, see Section 16900 for additional requirements.
- C. Make electrical connections to equipment in accordance with equipment manufacturer's instructions.

1. Verify that wiring and outlet rough-in work is complete and that equipment is ready for electrical connection, wiring, and energization.
  2. Make wiring connections in control panel or in wiring compartment of pre-wired equipment. Provide interconnecting wiring as required by equipment manufacturer.
  3. Install and connect disconnect switches, controllers, control stations, and control devices as required by equipment manufacturer.
  4. Make conduit connections to equipment using flexible conduit. Use liquid-tight flexible conduit in damp or wet locations.
  5. Install pre-fabricated cord set where connections with attachment plug is indicated or specified, or use attachment plug with suitable strain-relief clamps.
  6. Provide suitable strain-relief clamps for cord connections to outlet boxes and equipment connection boxes.
- D. Install support systems sized and fastened to accommodate weight of equipment and conduit, including wiring, which they carry.
1. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using precast insert system, expansion anchors, preset inserts, beam clamps, or spring steel clips.
  2. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion and anchors on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.
  3. Do not fasten supports to piping, ceiling support systems, ductwork, mechanical equipment, conduit, etc.
  4. Do not use powder-actuated anchors.
  5. Do not drill structural steel members.
  6. Fabricate supports from structural steel or steel channel.
  7. Install surface mounted cabinets and panelboards with minimum of four anchors.
  8. Provide steel channel supports to stand cabinets one inch off wall in wet locations.
  9. Bridge studs top and bottom with channels to support flush mounted cabinets and panelboards in stud walls.
  10. Install free-standing electrical equipment on 4 inch high concrete pads.
- E. Identify electrical distribution and control equipment, and loads served, to meet regulatory requirements and as specified herein.
1. Degrease and clean surface to receive nameplates.

2. Secure nameplates to equipment fronts using screws or rivets with edges parallel to equipment lines.
  3. Use nameplates with 1/4 inch lettering to identify Switchboard, Panelboards, Safety Switches, Motor Starters and Branch Devices of Switchboards.
  4. Panel directories shall accurately indicate load served and location of load.
  5. Engrave plates as indicated by Schedules on the Drawings.
- F. Install wire markers on each conductor in panelboard gutters, boxes, and at load connections.
1. Use distribution panel and branch circuit or feeder number to identify power and lighting circuits.
  2. Use control wire number as indicated on schematic and interconnection diagrams or equipment manufacturer's shop drawings to identify control wiring.
- G. Excavating, trenching, and backfilling shall be accomplished as indicated on the Drawings or where required to install systems and/or equipment.
1. Trenches for all underground conduits or equipment shall be excavated to the required depths. Where soft, wet, or unstable soil is encountered, the bottom of the trench shall be filled with 6 inches of compacted gravel and sand fill. All trench bottoms shall be tamped hard. Trenches shall be shored as required to meet OSHA requirements and general safe working conditions.
  2. After conduits or equipment have been inspected and approved by the Architect and prior to backfilling, all forms shall be removed and the excavation shall be cleaned of all trash and debris. Material for backfilling shall consist of the excavation, or borrow of sand, gravel, or other materials approved by the Architect and shall be free of trash, lumber, or other debris. Backfill shall be placed in horizontal layers, not exceeding 9 inches in depth and properly moistened to approximate optimum requirements. Each layer shall be compacted by hand or machine tamped to a density equivalent to surrounding soil.
- H. Cleaning and Painting: The respective Contractors for the various phases of work shall clear away all debris, surplus materials, etc., resulting from their work or operations, leaving the job and equipment furnished in the clean first class condition.
1. All fixtures and equipment shall be thoroughly cleaned of plaster, stickers, rust, stains and other foreign matter or discoloration, leaving every part in an acceptable condition ready for use.
  2. The Contractor shall refinish and restore to the original condition and appearance, all electrical equipment which has sustained damage to manufacturer's prime and finish coats or enamel or paint. Materials and workmanship shall be equal to the requirements described for other painting.
- I. Cutting and Patching: This Contractor shall provide all cutting, digging, etc., incident to his work

and shall make all required repairs thereafter to the satisfaction to the Engineer, but in no case shall the Contractor cut into any major structural element, beam, or column without written approval of the Engineer.

1. Pavements, sidewalks, roads, curbs, walls, ceilings, floors, and roofs shall be cut, patched, repaired and/or replaced as required to permit the installation of the electrical work.
2. The Contractor shall bear the expense of all cutting, patching, painting, repairing, or replacing of the work of other trades required because of his fault, error, or tardiness or because of any damage done by him.

**END OF SECTION**

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## SECTION 16500-LED INTERIOR LIGHTING

### PART 1 - GENERAL

Luminaire Schedule: Product requirements for each luminaire are specified in luminaire schedule on Drawings. **EQUALS MUST BE SUBMITTED TO ARCHITECT/ENGINEER FOR APPROVAL 10 DAYS PRIOR TO SUBMITTING BID.**

#### 1.1 SUMMARY

A. Section includes the following types of LED luminaires:

1. Cylinder.
2. Downlight.
3. Lowbay.
4. Recessed linear.
5. Strip light.
6. Surface mount, linear.
7. Surface mount, nonlinear.
8. Suspended, linear.
9. Suspended, nonlinear.
10. Materials.
11. Finishes.
12. Luminaire support.

#### 1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. LED: Light-emitting diode.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product, arranged by designation.
- B. Shop Drawings: For nonstandard or custom luminaires.

1. Include plans, elevations, sections, and mounting and attachment details.
2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

C. Product Schedule: For luminaires and lamps, **Use same designations indicated on Drawings.**

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale and coordinated with each other, using input from installers of the items involved:
- B. Seismic Qualification Certificates: For luminaires, accessories, and components, from manufacturer.
- C. Product Certificates: For each type of luminaire.
- D. Sample warranty.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

#### 1.6 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: **Five** year(s) from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE 7.
- B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.
  1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified."

## 2.2 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Standards:
  - 1. ENERGY STAR certified.
  - 2. California Title 24 compliant.
  - 3. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
  - 4. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
  - 5. UL Listing: Listed for damp location.
  - 6. Recessed luminaires shall comply with NEMA LE 4.
- C. CRI of minimum 80. CCT of minimum 2700 K (interior fixtures) and minimum 4000 K (exterior fixtures).
- D. Rated lamp life of 50,000 hours to L70.
- E. Lamps dimmable from 100 percent to 0 percent of maximum light output.
- F. Internal driver.
- G. Nominal Operating Voltage: 120-277 V ac..
  - 1. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
- H. Housings:
  - 1. Extruded-aluminum housing and heat sink.
  - 2. Fixture dependent; refer to 'LIGHTING FIXTURE SCHEDULE' on drawings.

## 2.3 CYLINDER Retain this article for exposed, wall-mounted luminaires, used for direct or indirect lighting.

- A. If 'Other Than Specified' fixtures are to be considered as equal for bidding, equal fixture shall be submitted to Architect/Engineer a minimum of 10 days prior to submitting bid.
- B. Minimum 1000 lumens. Minimum allowable efficacy of 80 lumens per watt.
- C. With integral mounting provisions.

## 2.4 DOWNLIGHT

- A. Minimum 1,000 lumens. Minimum allowable efficacy of **80** lumens per watt.
- B. Universal mounting bracket.

- C. Integral junction box with conduit fittings.
- D. Optics:
  - 1. Refer to drawings to determine if fixtures are to have Fixed or Adjustable lens.
  - 2. Refer to drawings to determine Spot/[Medium/[Wide light distribution.

## 2.5 LOWBAY

- A. Minimum 5,000 lumens. Minimum allowable efficacy of 80 lumens per watt.
- B. Universal mounting bracket.

## 2.6 RECESSED LINEAR

- A. Minimum 1,500 lumens. Minimum allowable efficacy of 85 lumens per watt.
- B. Integral junction box with conduit fittings.

## 2.7 STRIP LIGHT

- A. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- B. Integral junction box with conduit fittings.

## 2.8 SURFACE MOUNT, LINEAR

- A. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- B. Integral junction box with conduit fittings.

## 2.9 SURFACE MOUNT, NONLINEAR

- A. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- B. Integral junction box with conduit fittings.

## 2.10 SUSPENDED, LINEAR

- A. Minimum 1,500 lumens. Minimum allowable efficacy of 85 lumens per watt.

## 2.11 SUSPENDED, NONLINEAR

- A. Minimum 1,500 lumens. Minimum allowable efficacy of 85 lumens per watt.

- B. Integral junction box with conduit fittings.

## 2.12 MATERIALS

### A. Metal Parts:

1. Free of burrs and sharp corners and edges.
2. Sheet metal components shall be steel unless otherwise indicated.
3. Form and support to prevent warping and sagging

- B. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

### C. Diffusers, and Globes:

1. Acrylic: One hundred percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
2. Glass: Annealed crystal glass unless otherwise indicated.
3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

### D. Housings:

1. Extruded-aluminum housing and heat sink.
2. Refer to drawings for type of finish.

## 2.13 METAL FINISHES

- A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

## 2.14 LUMINAIRE SUPPORT

- A. Comply with requirements in Section 16400 "Basic Electrical Materials & Methods" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.
- C. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gage.
- D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- C. Install lamps in each luminaire.
- D. Supports: Sized and rated for luminaire weight.
- E. Flush-Mounted Luminaire Support: Secured to outlet box.
- F. Wall-Mounted Luminaire Support:
  - 1. Attached to structural members in walls, to a minimum 20 gauge backing plate attached to wall structural members, or using through bolts and backing plates on either side of wall.
  - 2. Do not attach luminaires directly to gypsum board.
- G. Ceiling-Mounted Luminaire Support:
  - 1. Ceiling mount with minimum one (1) 5/32-inch diameter aircraft cable supports 120 inches in length.
  - 2. Ceiling mount with pendant mount with 5/32-inch diameter aircraft cable supports adjustable to [120 inches in length.
  - 3. Ceiling mount with hook mount.
- H. Suspended Luminaire Support:
  - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
  - 2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
  - 3. Continuous Rows of Luminaires: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of luminaire chassis, including one at each end.
  - 4. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.
- I. Ceiling-Grid-Mounted Luminaires:
  - 1. Secure to any required outlet box.
  - 2. Secure luminaire using approved fasteners in a minimum of four locations, spaced near corners of luminaire.
- J. Comply with requirements in Section 16100 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

### 3.2 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
  - 1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
  - 2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.
- B. Luminaire will be considered defective if it does not pass operation tests and inspections.
- C. Prepare test and inspection reports.

**END OF SECTION**

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## SECTION 16700 - SURGE PROTECTION FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

### I. GENERAL

#### 1.01 RELATED SECTIONS

- A. The Contractor shall furnish and install the Transient Voltage Surge Suppression (TVSS) equipment having the electrical characteristics, ratings and modifications as specified herein and as shown on the contract drawings. Refer to related sections for surge requirements in:

#### 1.02 RELATED SECTIONS

- a) Section 16300 -- Panelboards

#### 1.03 REFERENCES.

The TVSS units and all components shall be designed, manufactured and tested in accordance with the latest applicable UL Listed standards (UL 1449, 2<sup>nd</sup> Edition), UL 1283 and CSA certified per CSA 22.2

#### 1.04 SUBMITTALS

- A. The following information shall be submitted to the Engineer:
  - 1. Provide verification that the TVSS device complies with the required UL 1449 2<sup>nd</sup> Edition and CSA approvals.
  - 2. Provide actual let through voltage test data in the form of oscillograph results for the ANSI/IEEE C62.41 Category C3 & C1 (combination wave) and B3 (ringwave) tested in accordance with ANSI/IEEE C62.45.
  - 3. Provide spectrum analysis of each unit based on MIL-STD-220A test procedures between 50 kHz and 200 kHz verifying the device's noise attenuation exceeds 41 dB at 100 kHz.
  - 4. Provide test report from a recognized independent testing laboratory verifying the suppressor components can survive published surge current rating on both a per mode and per phase basis using the IEEE C62.41, 8 x 20 microsecond current wave. Note that test data on individual module is not accepted.
- B. Submit five (5) copies of the above information.

#### 1.05 SUBMITTALS – FOR INFORMATION:

When requested by the Engineer the following product information shall be submitted to the engineer:

- a) UL 1449 Listing classifications, and clamping voltage rating for each mode of protection.
- b) ANSI/IEEE C62.41 AND C62.45 Category C3 clamping voltage.
- c) Sequential surge survivability per ANSI/IEEE C62.45.
- d) Dimensions and weight
- e) Recommended connection wiring diagram

#### 1.06 QUALIFICATIONS

- A. Manufacturer must have a minimum of five years (in U.S.) experience in producing TVSS systems.
- B. TVSS devices and accessories shall be obtained through one manufacturer.
- C. Other manufacturers not listed in this document may be considered by the engineer/architect at least 14 days prior to bid. The specifications of the product listed in 1.05 "SUBMITTALS-FOR INFORMATION" shall be highlighted.

#### 1.07 DELIVERY, STORAGE AND HANDLING

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these Shall be included with the equipment at time of shipment.

#### 1.08 OPERATION AND MAINTENANCE MANUALS

- A. Five (5) copies of the equipment operation and maintenance manuals shall be provided.
- B. Operation and maintenance manuals shall include the following information:
  - 1. Instruction books and/or leaflets
  - 2. Recommended renewal parts list

#### 1.10 EXTRA MATERIALS:

- A. Furnish replaceable protection modules for service entrance unit with labeled protective covering for storage.

### II. PRODUCTS

#### 2.01 MANUFACTURERS

- A. Cutler-Hammer, Square D, Advanced Protection Technologies (APT), Surge Suppression Inc.

#### 2.02 VOLTAGE SURGE SUPPRESSION – GENERAL

- A. Electrical Requirements

1. Unit Operating Voltage -- Refer to drawings for operating voltage and unit configuration.
2. Maximum Continuous Operating Voltage (MCOV) -- The MCOV shall be greater than 115% of the nominal system operating voltage.
3. Protection Modes -- For a wye configured system, the device must have directly connected suppression elements between line-neutral (L-N), line-ground (L-G), and neutral-ground (N-G). For a delta configured system, the device must have suppression elements between line to line (L-L) and line to ground (L-G).
4. UL 1449 2<sup>nd</sup> Edition SVR -- The maximum UL 1449 2<sup>nd</sup> Edition SVR for the device must not exceed the following:

Modes	208Y/120	480Y/277	600Y/347
L-N; L-G; N-G	500 V	900 V	1000 V
L-L	900 V	1500 V	1800 V

5. ANSI/IEEE Cat C3 Let Through Voltage -- The let through voltage based on IEEE C62.41 and C62.45 recommended procedures for Category C3 surges (20 kV, 10 kA) shall be less than:

Modes	208Y/120	480Y/277	600Y/347
L-N	910 V	1070 V	1300 V

6. ANSI/IEEE Cat. B3 Let Through Voltage -- Let through voltage based on IEEE C62.41 and C62.45 recommended procedures for the ANSI/IEEE Cat. B3 ringwave (6 kV, 5000 amps) shall be less than:

Modes	208Y/120	480Y/277	600Y/347
L-N	375 V	510 V	300 V

#### B. TVSS Design

1. Balanced Suppression Platform -- The surge current shall be equally distributed to all MOV components to ensure equal stressing and maximum performance. The surge

suppression platform must provide equal impedance paths to each matched MOV. Designs incorporating TVSS modules shall not be acceptable.

2. Electrical Noise Filter -- Each unit shall include a high-performance EMI/RFI noise rejection filter. Noise attenuation for electric line noise shall be 41 dB at 100 kHz using the MIL-STD-220A insertion loss test method. The unit shall be complimentary listed to UL 1283. Products not able to demonstrate noise attenuation of 41 dB @ 100 kHz shall be rejected.
3. Internal Connections -- No plug-in component modules shall be used as surge current conductors. All internal components shall be hardwired with connections utilizing low impedance conductors and compression fittings.
4. Safety and Diagnostic Monitoring -- Each unit shall be equipped with 200 kAIC internal fuses. Each unit shall provide the following three levels of monitoring:
  - a) Continuous monitoring of fusing system
  - b) Thermal detection circuit shall monitor for overheating in all modes due to thermal runaway.
  - c) A green/red solid state indicator light shall be provided on each phase. The absence of a green light and the presence of a red light, shall indicate which phase(s) have been damaged. Fault detection will activate a flashing trouble light. Units which can not detect open-circuit damage, thermal conditions and over current will not be accepted.
5. Warranty -- The manufacturer shall provide a full ten (10) year warranty from the date of shipment against any TVSS part failure when installed in compliance with manufacturer's written instructions and any applicable national or local electric code.

### 2.03 SYSTEM APPLICATION

- A. The TVSS applications covered under this section include distribution and branch panel locations, bus plugs, motor control centers (MCC), switchgear, and switchboard assemblies.
  
  
  
  
  
  
  
  
  
  
- B. Surge Current Capacity -- The minimum total surge current 8 x 20 microsecond waveform that the device is capable of withstanding shall be as shown in the following table:

<u>Application</u>	<u>Min. Surge Current (per mode)</u>
Service Entrance (Switchboards Switchgear, MCC Main Entrance)	120 kA
Distribution Panelboards	80 kA

High Exposure Roof Top Locations 80 kA

Branch Locations (Panelboards,  
MCC's, Busway) 40 kA

#### 2.04 Accessories

- A. Push to test feature to verify operational integrity.
- B. Form C dry contacts one NO, one NC for remote status monitoring.

#### 2.05 Enclosures

- A. All enclosed equipment shall have NEMA 1 general purpose enclosures, unless otherwise noted. Provide enclosures suitable for locations as indicated on the drawings and as described below:
  1. NEMA 1 surface or flush-mounted general purpose enclosures primarily intended for indoor use
  2. NEMA 12 dust-tight enclosures intended for indoor use primarily to provide protection against circulating dust, falling dirt and dripping non-corrosive liquids (Panelboards Only)
  3. NEMA 3R rainproof enclosures intended for outdoor use primarily to provide protection against rain, sleet and damage from external ice formation
  4. NEMA 4 watertight stainless steel intended for indoor or outdoor use primarily to provide protection against windblown dust and rain, splashing rain, hose-directed water, and damage from external ice formation. (Side Mounted Units Only)

### III. EXECUTION

#### 3.01 Examination

#### 3.02 Factory testing

- A. Standard factory tests shall be performed on the equipment under this section. All tests shall be in accordance with the latest version of NEMA and UL standards.

#### 3.03 Installation

- A. The Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings.
- B. Surge protection devices shall be installed and connected before the service entrance is connected or energized.
- C. Existing utilities shall not be interrupted without written permission from project's architect.

**END OF SECTION**

## SECTION 16721 – FIRE DETECTION AND ALARM

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES:**

- A. Fire alarm and smoke detection system.

#### **1.02 REFERENCES:**

- A. NFPA 13: Standard for the Installation of Sprinkler Systems.
- B. NFPA 13A: Recommended Practice for the Inspection, Testing and Maintenance of Sprinkler Systems.
- C. NFPA 70: National Electrical Code
- D. NFPA 72: Installation, Maintenance, and Use of Local Protective Signaling System.
- E. NFPA 72E: Automatic Fire Detectors.
- F. NFPA 72G: Notification Appliances for Protective Signaling Systems.
- G. NFPA 72H: Guide for Testing Procedure for Local, Auxiliary, Remote Station and Proprietary Protective Signaling Systems.
- H. NFPA 90: Standard for the Installation of Air Conditioning and Ventilating Systems.
- I. NFPA 101: Life Safety Code.

#### **1.03 REGULATORY REQUIREMENTS:**

- A. Systems: UL and FM listed.
- B. Conform to requirements of NFPA.
- C. Conform to requirements of Standard Building Code.
- D. Conform to requirements of American's with Disabilities Act - ADA.

#### **1.04 SYSTEM REQUIREMENTS:**

- A. The system shall include, but not be limited to the following elements.
  - 1. Master system CPU including all fire detection.
  - 2. Circuit interface panels including all modules.
  - 3. Power supplies, batteries and battery chargers.

4. Equipment enclosures.
5. Intelligent addressable manual pull stations, heat detectors, analog smoke detectors, alarm monitoring modules, and supervised control modules.
6. Annunciator panels, printers and video display terminals.
7. Audible and visual evacuation signals.
8. Color graphic displays and historical archiving.
9. Software and firmware as required to provide a complete functioning system.
10. Wiring and raceway.
11. Installation, testing and certification and education labor.
12. Multiplex, system driven remote annunciator.

**1.05 SYSTEM FUNCTION:**

- A. The system shall be a complete, electrically supervised multiplex style fire detection and audio/visual evacuation system with intelligent analog alarm initiation, to be device addressable and annunciated as described and shown on the Drawings.
- B. The system shall support intelligent analog smoke detection, conventional smoke detection, manual station, water flow, supervisory, security, and status monitoring devices. The system shall also support audio/visual circuits.
- C. The panel shall be UL listed as a test instrument for the measurement of the sensitivity of connected intelligent analog ionization and photoelectric smoke detectors to comply with the testing requirements of NFPA 72E.
- D. The system shall annunciate a trouble condition when any smoke detector approaches 80% of its alarm threshold due to gradual contamination, signaling the need for service and eliminating unwanted alarms.
- E. Any intelligent analog smoke detector or conventional smoke detector zone shall include a selectable alarm verification capability. This feature shall provide automatic verification capability. This feature shall provide automatic verification of smoke detector alarms as described by NFPA 72E.
- F. The system shall recognize initiating of an alarm and indicate the alarm condition in a degrade mode of operation, in the event of processor failure or the loss of system communications to the circuit interface panels.
- G. The system shall provide a one-person field test of either the complete system or a specified area, maintaining full function of areas not under test.
- H. The system shall be provided with eight levels of password protection with up to forty passwords.
- I. The system shall be programmed in the field via a laptop computer. All programmed information

shall be stored in nonvolatile memory after downloading into the control panel. No special programming terminal or prom burning shall be required and the system shall continue in service during reprogramming. Systems requiring online programming or not capable of mass uploading of software for offsite documentation or editing will not be considered acceptable.

- J. The system shall consist of central architecture using a single centrally located control unit. The system also shall be operable in a distributed multiplex architecture using a centrally located control unit with interconnection to remote circuit interface panels containing any combination of plug-in intelligent analog signaling circuits, plug in conventional initiating device circuits and plug in relays.
- K. The system shall support a UL listed supervised printer.
- L. The system as installed shall be expandable to its predetermined maximum capacity of 3,000 initiation devices and/or 2,000 combined zones of audio/visual devices.

#### **1.06 SYSTEM OPERATION:**

- A. Activation of any fire alarm initiating device shall cause the following actions and indications:
  - 1. Display a custom message describing the device originating the alarm condition, at the fire alarm control panel LCD alpha numeric display. Remote LCD annunciators shall display the alarm condition via unique messages as required by the system Owner. LED type annunciator displays conventional and graphic style shall indicate alarm zoning as specified.
  - 2. Sound the audio/voice circuits, and activate the visual signals.
  - 3. Shut down all air handling units within the smoke zone of alarm origin.
  - 4. Furnish an alarm system closure for connection to an off-site reporting device as contracted for by the system user, via a dialer provided under this Section.
  - 5. Close all smoke doors and smoke dampers (if any present in facility) shown on the Drawings to prevent the spread of smoke.
  - 6. Record within the non-volatile system historical memory the occurrence of the event, the time and date of occurrence and the device initiating the event.
- B. Activation of any smoke detector or two cross zoned smoke detectors in a single elevator lobby or an elevator equipment room shall, besides the actions described above, cause the recall of that bank of elevators to the terminal floor and the lockout of controls. In the event of recall initiation by a detector in the first floor lobby, the recall shall be to the alternate floor.
- C. Activation of any detector in an elevator hoistway or machine room shall cause the capture of that bank of elevators per local requirements, upon completion of these actions, activate the sprinkler system pre-action release panel.
- D. Activation of any supervisory circuit, shall cause the following actions and indications:
  - 1. Display the origin of the supervisory condition report at the alarm control panel alphanumeric LCD display.

2. Activate supervisory audible and visual signals as indicated on the Drawings.
  3. Furnish an alarm system closure for connection to an off-site reporting device as contracted for by the system user.
  4. Record the occurrence of the event, the time of occurrence and the device initiating the event.
- E. Receipt of a trouble report (primary power loss, open or grounded initiating or signaling circuit wiring, open, grounded or shorted indication system wiring, device communication failure, battery disconnect) at the fire alarm control panel shall cause the following actions and indications:
1. Display at the alarm control panel alphanumeric LCD display, the origin of the trouble condition report.
  2. Activate trouble audible and visual signals at the control panel and as indicated on the Drawings.
  3. Furnish an alarm system closure for connection to an off-site reporting device as contracted for by the system user, via a Dialer furnished under this Section.
  4. Record the occurrence of the event, the time of occurrence and the device initiating the event.

**1.07 SYSTEM ZONING:**

- A. Each intelligent addressable device or conventional zone on the system shall be displayed at the fire alarm control panel by a unique alpha numeric label identifying its location.

**1.08 QUALIFICATIONS:**

- A. Manufacturer: Company specializing in smoke detection and fire alarm systems with five years experience and an office within 125 miles of job site.
- B. Installer: Company specializing in smoke detection and fire alarm system with three years experience.

**1.09 SUBMITTALS:**

- A. Submit shop Drawings and products data.
- B. Provide wiring diagrams, data sheets, and equipment ratings, layout, dimensions, and finishes. Include location of end-of-line devices.
- C. Submit manufacturer's installation instructions.

**1.10 OPERATION AND MAINTENANCE DATA:**

- A. Submit as-built Drawings indicating location of all devices, wiring, and end-of-line devices.
- B. Include operating instructions, and maintenance and repair procedures.

- C. Include manufacturer representative's letter stating that system is operational, and install in accordance with NFPA 72A, 72B, 72E, 72G and 101 and tested in accordance with NFPA 72H.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS:**

- A. Pyrotronics, Simplex, EST, Gamewell, Notifier, and FCI (Fire Control Instruments)

### **2.02 FIRE ALARM CONTROL PANEL:**

- A. The control panel shall be modular in construction and shall include, but not limited to; the hardware, software and firmware required to perform system functions.
- B. The control panel shall be housed within a code gage steel enclosure flush wall mounted.
- C. System power supplies shall be housed within the enclosure. Primary power supply shall be from the building distribution system. Secondary power shall be provided by internal sealed gelled electrolyte batteries with capability to operate the system for eight (8) hours.
- D. The panel shall provide a system for maintaining a historical event record.

### **2.03 FIRE ALARM INITIATING DEVICES:**

- A. Smoke Detector, Intelligent Ionization: The detector shall be addressable, dual chamber, self compensating for ambient temperature and humidity. Detectors shall be suitable for two wire operation.
- B. Smoke Detector, Intelligent Photoelectric: The detector shall be addressable, self compensating for ambient temperature and humidity with integral self, restoring 135 degree heat detector. Detectors shall be suitable for two wire operation.
- C. Smoke Detector, Intelligent Duct Type: The detector shall be addressable, self compensating for ambient temperature and humidity, ionization or photoelectric type as application requires.
- D. Smoke Detector, Projected Beam: The detector shall consist of an infrared light beam transmitter and a light receiver. The detector shall be self compensating for ambient and temperature changes.
- E. Thermal Detector, Intelligent: The detectors shall be addressable, rate compensated rated at 135 degrees or 200 degrees Fahrenheit. Detectors shall be suitable for two wire operation.
- F. Manual Pull Station, Intelligent: The pull station shall be addressable single station type. Pull stations shall be flush wall mounted.

### **2.04 ZONE AND INTERFACE MODULES:**

- A. Remote Conventional Zone Module: Provide, for integration of compatible 2 wire and shorting style contact devices into the analog signaling circuit.

- B. Intelligent System Interface Module: Furnish and install, for the monitoring of contact type initiation devices and for the control of electrical devices where required.
- C. Intelligent Supervised Control Module: Furnish and install for the control of supervised relays, contractors, audible signal circuits, visual signal circuits, distributed speaker circuits and two way fire fighters communication circuits.

**2.05 EVACUATION/SIGNALLING DEVICES:**

- A. Evacuation Horn(Speaker where required)/Strobe. Provide audible horns with strobe as indicated on the Drawings. Integral strobe shall be flashing, polarized type with polycarbonate lens producing 8000 peak candlepower at one flash per second.
- B. Evacuation Strobe: Provide visual evacuation strobes at locations indicated on the Drawings. Strobes shall be flush wall mounted, flashing, polarized type with polycarbonate lens producing 8000 peak candlepower at one flash per second.

**2.06 FIRE ALARM WIRE AND CABLE:**

- A. Fire Alarm Power Circuits: Building wire as specified in Section 16300. Minimum size conductors shall be 12 AWG.
- B. Fire Alarm Loop Circuits: Analog loop circuits shall be 18 AWG twisted pair.
- C. Fire Alarm Speaker Circuits: Speaker circuits shall be 18 AWG twisted pair.
- D. Fire Alarm Initiating and Strobe Circuits: Circuits shall be minimum 14 AWG building wire as specified in Section 16300.

**2.07 DIALER: Provide dialer for off-site notification.**

**PART 3 EXECUTION**

**3.01 INSTALLATION:**

- A. Install system in accordance with manufacturer's instructions.
- B. Install manual station with operating handle 48 inches above floor. Install audible and visual devices 80 inches above floor or as indicated.
- C. Install cables and wiring in conduit.
- D. Mount end-of-line device in control panel or in box with last device or separate box adjacent to last device in circuit.
- E. Make conduit and wiring connections to sprinkler flow switches, sprinkler valve tamper switches, duct smoke detectors, HVAC shutdown equipment, and elevator control equipment.
- F. Automatic Detector Installation: NFPA 72E.
- G. Provide surge suppression for all wiring of the fire alarm system.

**3.02 FIELD QUALITY CONTROL:**

- A. Field inspection and testing will be performed.
- B. Test in accordance with NFPA 72H and local fire department requirements.

**3.03 MANUFACTURER'S FIELD SERVICES:**

- A. Provide manufacturer's field services as required for installation.
- B. Include services of certified technician to supervise installation, adjustments, final connections, and system testing.
- C. Instruct Owner in operation and function of the system.

END OF SECTION

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# CITY OF COTTONDALE GENERATOR ADDITION PROJECT

## SECTION 16010 – GENERAL ELECTRICAL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General Conditions and Supplementary General Conditions sections apply to work specified in Division 16.

#### 1.2 DESCRIPTION OF WORK:

Furnish all labor, materials, equipment, and incidentals required to complete all electrical work as specified herein and shown on the Contract Drawings.

The work, apparatus and materials furnished under these Specifications and accompanying Drawings shall include all items listed here and shown on the Drawings. Line voltage connections to equipment furnished as specified in other sections of these Specifications or shown on other than the Electrical Drawings shall be governed by this Division of the Specifications.

Each bidder or his authorized representatives shall visit the job site and carefully inspect the present conditions before preparing his bid. The submission of a bid will be considered evidence that such a visit and inspection was performed by the bidder and that he takes full responsibility for all factors governing his work.

It is the intent of these Specifications and Drawings that the electrical systems shall be complete, fully operational, and suitable in every way for the service required. Drawings are diagrammatic in nature and do not show in every detail all devices and incidental materials necessary to accomplish the intent. Therefore, the Contractor shall understand that such devices and incidental materials required shall be furnished at no cost to the Owner.

#### 1.3 TEMPORARY LIGHTING AND POWER:

Provide temporary power during construction as required to keep each lift station operational. Bypass pumps may also be required to keep lift stations operational during construction.

The Contractor shall pay all service connection fees for temporary power installation and all electrical bills for temporary construction power required to complete the project.

Temporary wiring shall be done in a safe and neat manner. See Article 305 of the NEC.

#### 1.4 SUBMITTALS:

Manufacturers' data in the form of "cut sheets" and engineering drawings shall be submitted to the Engineer on the equipment listed below and in other Sections of Division 16 before delivery to the work site. Review of the submittal by the Engineer is to check for general conformance to the design intent and shall not relieve the Contractor of the responsibility for the correctness of all dimensions and the correct fitting of all parts of the work.

- Disconnect Switches
- Standby Generator
- Transfer Switch

The manufacturers' names and catalog numbers shall be submitted for the following materials:

- Conduit, Fittings, and Couplings
- Boxes and Fittings
- 600 Volt Wire

The submittal shall be thoroughly checked by the Contractor for accuracy and compliance with the contract requirements. Shop drawings and "cut sheets" shall bear the date checked and shall be accompanied by a statement by the Contractor that they have been checked for conformity to Specifications and Drawings. Shop submittals not so checked and noted will be returned without review.

#### 1.5 CODES, INSPECTION AND FEES:

Division 16 work shall be in accordance with the latest edition of the following codes and ordinances:

- The National Electrical Code (NFPA 70)
- The National Electrical Safety Code
- The Life Safety Code (NFPA 101)
- The Southern Standard Building Code (SBCCI)
- Serving Utility Company
- State and Municipal

Contractor shall pay all fees for permits and inspections.

#### 1.6 RECORD DRAWINGS:

At Job Close-out submit three (3) copies of the following:

Clean, complete, and accurate sets of Record Drawings showing clearly deviations to the Contract Drawings.

Bound sets of Equipment Operation and Maintenance Instructions.

CD with Operation and Maintenance Instructions

Test results required in other sections of this division.

#### 1.7 GUARANTEES:

In addition to the guarantee of equipment by the manufacturer the Contractor shall also guarantee such equipment for a period of one (1) year from final acceptance by the Owner. The Contractor's one (1) year guarantee shall be for equipment, materials, and labor.

Additional guarantee requirements may be in the General and Special Conditions of these specifications.

## **PART 2 - PRODUCTS**

#### 2.1 EQUIPMENT AND MATERIALS:

Furnish materials or equipment specified by manufacturer's names unless approval of other manufacturers is listed in addendum to these specifications.

The materials furnished shall be new, undamaged, and packed in the original manufacturer's packing.

Equipment and materials shall always during construction be protected from mechanical and water damage. Equipment shall not be stored out-of-doors. Damaged materials and equipment shall be replaced by the Contractor at no cost to the Owner.

All electrical panels, enclosures, raceways, conduit, and boxes shall be fabricated of metal unless indicated otherwise.

#### 2.2 EQUIPMENT AND MATERIALS STANDARDS:

The design and fabrication of electrical equipment and materials furnished under Division 16 shall comply with the latest edition and revisions of the following codes and standards:

The American National Standards Institute (ANSI)

The American Society of Mechanical Engineers (ASME)  
The American Society for Testing and Materials (ASTM)  
The Institute of Electrical and Electronic Engineers (IEEE)  
The National Electrical Manufacturers Association (NEMA)  
The Occupational Safety and Health Administration (OSHA)  
The Underwriters Laboratories (UL)  
The National Fire Protection Association (NFPA)  
The National Electrical Code (NEC)

### **PART 3 - EXECUTION**

#### **3.1 SUPERVISION**

The electrical work shall be supervised by a licensed journeyman or master electrician who shall be always on the job site while work is in progress.

#### **3.2 EQUIPMENT IDENTIFICATION:**

Engraved nameplates shall be of laminated plastic with black surface and white 1/8" high letters secured with stainless steel screws.

All major components of the distribution system shall have engraved nameplates.

#### **3.3 CLEANING:**

All equipment and boxes shall be thoroughly cleaned inside and outside at the completion of installation. Do not leave dirt and debris inside panelboard and equipment cabinets, device and junction boxes, etc.

#### **3.4 PAINTING:**

Touchup scratched or marred surfaces of lighting fixtures, panelboards, switchboards, etc. with paint furnished by the equipment manufacturers specifically for the purpose.

#### **3.5 EXCAVATION, TRENCHING AND BACKFILLING:**

Perform all excavation and trenching to install raceways indicated on the drawings.

No tunneling shall be allowed unless written permission is received by the Architect / Engineer.

Excavated material not suitable for backfill shall be removed from the job site.

Insure that the bottom of trenches is uniform (without large rocks or lumps of dirt) which could damage the raceway or conductors.

Backfill with material that will be compacted readily.

Compact backfill material, from bottom of excavation up, to 95% of surrounding undisturbed material.

Cover shall not be less than surrounding grade and no greater than 2" above surrounding grade.

### 3.6 TESTS:

Contractor shall test all wiring for shorts and proper grounding before energizing. Equipment shall be thoroughly checked and adjusted for proper operation. Motors shall be checked for proper rotation. Controls shall be checked to insure no 120V loads are on high leg of 240VAC high leg systems.

END OF SECTION 16010

# **CITY OF COTTONDALE GENERATOR ADDITION PROJECT**

## **SECTION 16110 – RACEWAYS AND FITTINGS**

### **PART 1 - GENERAL**

#### **1.1 SCOPE OF WORK:**

Furnish and install complete raceway systems as indicated on the Drawings and as specified here.

#### **1.2 APPLICATIONS:**

All interior and above grade exterior wiring shall be installed in a rigid aluminum metal conduit, and all embedded in concrete or below grade wiring shall be in PVC conduit unless indicated otherwise on the drawings.

All exterior, above grade, conduits shall be rigid aluminum.

Liquid Tight flexible metal raceway is acceptable as long as installed per NEC.

All conduit of a given type shall be the product of one manufacturer.

### **PART 2 - PRODUCTS**

#### **2.1 RIGID CONDUIT AND FITTINGS:**

Rigid aluminum conduit shall be conforming to the requirements of UL 6 and ANSI C80.1 standards.

Fittings for rigid aluminum conduit shall be the threaded type manufactured by RACO, Steel City, or Thomas & Betts (T&B).

Plastic conduit for direct burial shall be UL labeled Schedule 40 PVC manufactured to NEMA TC 2-1983 specifications, WC-1094A Federal specifications, and UL-651 specifications.

Fittings for plastic conduit shall be manufactured to NEMA TC 3-1982 specifications.

#### **2.2 FLEXIBLE METAL CONDUIT, COUPLINGS, AND FITTINGS:**

All flexible metal conduit for damp or exterior applications shall be Liquid Tight UL listed spiral

wound galvanized steel with a PVC outer jacket type.

Fittings for liquid tight conduit shall be manufactured RACO, Steel City, or T&B.

### 2.3 CONDUIT MOUNTING EQUIPMENT:

Hangers, rods, backplates, beam clamps etc. shall be hot-dipped galvanized iron, steel, or aluminum suitable for in a corrosive environment. They shall be as manufactured by the Appleton Electric Co., Thomas and Betts Co., Unistrut Corp., or approved equal.

## **PART 3 - EXECUTION**

### 3.1 INSTALLATION:

No conduit shall any have more than three 90 degree bends in any one run. Pull boxes shall be provided as required or directed.

No wire shall be pulled until the conduit system is complete in all details.

The ends of all conduits shall be tightly plugged to exclude dust and moisture during construction.

Aluminum conduit threads shall be cleaned and coated with a grease metallic type conductive compound suitable for use on nonferrous conduits.

Conduit support shall be spaced at intervals of 8 ft. or less, adjacent to all couplings, and additionally as required to obtain rigid construction.

Conduit hangers shall be attached to structural steel by means of beam or channel clamps.

Bends in parallel conduit runs shall be concentric. All conduits shall be run perfectly straight and true.

Conduit terminating in knockouts shall have Meyers hubs.

Conduits shall be installed using threaded fittings and couplings.

Liquid Tight Flexible metal conduit shall be used for all motor terminations, not in wet wells, and other equipment where vibration is present. Flexible conduit length shall not exceed 1'-6" in length for this application.

Liquid Tight Flexible metal conduit used for installing lighting fixtures shall not exceed 6' in length.

Where hazardous locations exist (as defined and classified by the National Electrical Code), all conduit, fittings and installation shall comply with Article 500 of the NEC. Conduits from wet wells shall have "seal offs" before entry into any control panel, junction box, etc and shall be schedule 80 rigid PVC.

Provide expansion coupling every 100 feet for long runs of conduit and at concrete expansion joints. Provide ground bonding jumpers around expansion couplings, used on metallic conduit, sized according to Table 250-95 of the NEC.

Set top of underground conduits a minimum of 1'-6" below finish subgrade, or as required for conditions defined by NEC, or as required per local codes. Service conduits shall be at minimum depth required by the serving electric utility company.

END OF SECTION 16110

# CITY OF COTTONDALE GENERATOR ADDITION PROJECT

## SECTION 16120 – WIRE AND CABLES

### PART 1- GENERAL

#### 1.1 SCOPE OF WORK:

Furnish, install, and test all wire, cable, and appurtenances as shown on the Drawings and as hereinafter specified.

#### 1.2 APPLICATIONS:

Wire for lighting and single power circuits shall be copper type XHHW-2, 90 degree C temperature rating and suitable for wet environments.

Single conductor wire for control, indication and metering shall be type XHHW-2, minimum No. 14 AWG, stranded copper.

Ground wires shall be Green and Neutrals shall be White or Gray. Green and White shall be used for these purposes only.

Color coding of all ungrounded service, feeder, and branch circuits conductors shall be required according to the following convention:

120/240 Volt, 1 phase: black and red

120/208 Volt, 3 phase: black, red, and blue

277/480 Volt, 3 phase: brown, orange, and yellow ( gray neutral)

Parallel wire runs shall be run in separate conduits of the same material and as close as possible to the same length.

#### 1.3 MINIMUM SIZES:

Except for control and signal leads, no wire smaller than No. 12 AWG shall be used.

## **PART 2- PRODUCTS**

### **2.1 MATERIALS:**

Wires and cables shall be of annealed, 98% conductivity, soft drawn copper unless indicated otherwise on the Drawings or in these Specifications.

All conductors No. 14 AWG and larger sizes shall be stranded.

### **2.2 600 VOLT WIRE:**

Type XHHW-2 shall be manufactured by Southwire, Okonite Co., or equal.

Multi-conductor control cable shall be stranded copper, 600 Volt polyvinyl chloride insulated and jacketed Type PNR as manufactured by Cerro Wire and Cable Co., General Electric, The Okonite Co., or equal.

### **2.3 WIRE GREATER THAN 600V:**

NONE

### **2.4 INSTRUMENTATION CABLE:**

Process instrumentation wire shall be twisted pair, 600 Volt, polyethylene insulated, copper tape shielded, polyvinyl chloride jacketed, manufactured by General Electric Co., Okonite Co., Belden Corp., or equal.

### **2.5 WIRE AND CABLE MARKERS:**

Wire and cable markers shall be "Omni-Grip" as manufactured by W.H. Brady Co., or equal.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION:**

All conductors shall be carefully handled to avoid kinks or damage to insulation.

All wires, cables and each conductor of multi-conductor cables shall be uniquely identified at each end by color or with wire and cable markers. Lighting and receptacle wiring shall be distinctly differentiated and junction boxes marked.

Lubrications shall be used, if required, to facilitate wire pulling. Lubricants shall be U.L. approved

for use with the insulation specified.

Shielded instrumentation wire shall be installed from terminal to terminal with no splicing at any intermediate point.

Shielding on instrumentation wire shall be grounded at the transmitter end only.

### 3.2 TESTS:

All 600 Volt wire insulation shall be tested with a "megger" after installation. Tests shall be made at not less than 500 Volts.

END OF SECTION 16120

# **CITY OF COTTONDALE GENERATOR ADDITION PROJECT**

## **SECTION 16170 – DISCONNECT SWITCHES**

### **PART 1 - GENERAL**

#### **1.1 SCOPE OF WORK:**

Furnish and install all circuit disconnects (safety switches) indicated on the Drawings and as specified herein.

#### **1.2 APPLICATIONS:**

Provide fused or non-fused disconnects as indicated or as required for the application.

Disconnect switches for exterior application shall be NEMA 4X stainless steel.

### **PART 2 - PRODUCTS**

#### **2.1 GENERAL:**

Disconnect switches shall be NEMA type HD (Heavy Duty) and UL listed.

Switches shall have switch blades fully visible in the "OFF" position when the door is open.

Switches shall be quick-make, quick-break such that, the operation of the contacts (blades) shall not be capable of being restrained by the operation of the operating handle after the closing or opening action has been initiated.

The operating handle shall be an integral part of the switch's box and not the switch's door.

Provisions for padlocking the switch in the "OFF" position with at least three (3) locks shall be provided.

Switches shall have interlock to prevent the unauthorized opening of the door when the handle is in the "ON" position.

The handle position shall clearly indicate whether the switch is "ON" or "OFF".

2.2 CONSTRUCTION:

NEMA 4X enclosures shall be manufactured from stainless steel.

2.3 RATINGS:

Lugs shall be front removable and be UL listed for aluminum or copper conductors at 60°C or 75°C.

Disconnect switches shall be horsepower rated.

**PART 3 - EXECUTION**

3.1 INSTALLATION:

Disconnects shall be labeled according to Section 16010.

END OF SECTION 16170

# CITY OF COTTONDALE GENERATOR ADDITION PROJECT

## SECTION 16200 – AUTOMATIC TRANSFER SWITCHES

### PART 1 GENERAL

#### 1.01 SCOPE:

Furnish 2 pole or 3 pole, mechanically held Automatic Transfer Switches as shown on the drawings and specified herein. The Automatic Transfer Switches shall be housed in NEMA 4X stainless steel enclosures and include integral surge protection.

#### 1.02 CODES & STANDARDS:

The automatic transfer switches and controls shall conform to the requirements of:

- A. UL 1008 - Standard for Transfer Switch Equipment
- B. IEC 947-6-1 Low-voltage Switchgear and Control gear; Multifunction equipment; Automatic Transfer Switching Equipment
- C. NFPA 70 - National Electrical Code
- D. NFPA 110 - Emergency and Standby Power Systems
- E. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- F. NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches
- G. UL 508 Industrial Control Equipment

#### 1.03 ACCEPTABLE MANUFACTURERS:

Automatic transfer switches shall be ASCO, Generac, Cummins, or Kohler. Alternate bids must list any deviations from this specification.

### PART 2 PRODUCTS

#### 2.01 MECHANICALLY HELD TRANSFER SWITCH:

- A. The transfer switch shall be electrically operated and mechanically held. The electrical operator shall be a momentarily energized, single-solenoid mechanism. Main operators which include overcurrent disconnect devices, linear motors or gears shall not be acceptable. The switch shall be mechanically interlocked to ensure only two possible positions, normal or emergency.
- B. All transfer switch sizes shall use only one type of main operator for ease of maintenance and commonality of parts.

- C. The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life.
- D. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented, blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts.
- E. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. Switches rated 600 amps and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars.
- F. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof, which are not intended for continuous duty, repetitive switching, or transfer between two active power sources, are not acceptable.
- G. Where neutral conductors must be switched as shown on the plans, the ATS shall be provided with fully rated overlapping neutral transfer contacts. The neutrals of the normal and emergency power sources shall be connected together only during the transfer and retransfer operation and remain connected together until power source contacts close on the source to which the transfer is being made. The overlapping neutral contacts shall not overlap for a period greater than 100 milliseconds. Neutral switching contacts which do not overlap are not acceptable.
- H. Where neutral conductors are to be solidly connected as shown on the plans, a neutral conductor plate with fully rated AL-CU pressure connectors shall be provided.
- I. Surge protection shall be furnished as an integral component to the ATS switch.

## 2.02 MICROPROCESSOR CONTROLLER:

- A. The controller's sensing and logic shall be provided by a single built-in microprocessor for maximum reliability, minimum maintenance, and the ability to communicate serially through an optional serial communication module.
- B. A single controller shall provide twelve selectable nominal voltages for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to  $\pm 1\%$  of nominal voltage. Frequency sensing shall be accurate to  $\pm 0.2\%$ . The panel shall be capable of operating over a temperature range of -20 to +60 degrees C and storage from -55 to +85 degrees C.
- C. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance. Sensing and control logic shall be provided on multi-layer printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers. The panel shall be enclosed with a protective cover and be mounted separately from the transfer switch unit for safety and ease of maintenance. The protective cover shall include a built-in pocket for storage of the operator's manuals.

- D. All customer connections shall be wired to a common terminal block to simplify field-wiring connections.
- E. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:
  - 1. EN 55011:1991 Emission standard - Group 1, Class A
  - 2. EN 50082-2:1995 Generic immunity standard, from which:
    - EN 61000-4-2:1995 Electrostatic discharge (ESD) immunity
    - ENV 50140:1993 Radiated Electro-Magnetic field immunity
    - EN 61000-4-4:1995 Electrical fast transient (EFT) immunity
    - EN 61000-4-5:1995 Surge transient immunity
    - EN 61000-4-6:1996 Conducted Radio-Frequency field immunity
  - 3. IEEE472 (ANSI C37.90A) Ring Wave Test.

#### 2.03 ENCLOSURE:

- A. The ATS shall be furnished in a NEMA 4X stainless steel enclosure, unless otherwise shown on the plans.
- B. All standard and optional door-mounted switches and pilot lights shall be 16-mm industrial grade type or equivalent for easy viewing & replacement. Door controls shall be provided on a separate removable plate, which can be supplied loose for open type units.

### **PART 3 OPERATION**

#### 3.01 CONTROLLER DISPLAY & KEYPAD:

- A. A four line, 20 character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial communications input port. The following parameters shall only be adjustable via DIP switches on the controller:
  - 1. Nominal line voltage and frequency
  - 2. Single or three phase sensing
  - 3. Operating parameter protection
  - 4. Transfer operating mode configuration  
(Open transition, Closed transition, or Delayed transition)

All instructions and controller settings shall be easily accessible, readable and accomplished without the use of codes, calculations, or instruction manuals.

### 3.02 VOLTAGE, FREQUENCY, & PHASE ROTATION SENSING:

- A. Voltage and frequency on both the normal and emergency sources (as noted below) shall be continuously monitored, with the following pickup, dropout and trip setting capabilities (values shown as % of nominal unless otherwise specified):

<u>Parameter</u>	<u>Sources</u>	<u>Dropout / Trip</u>	<u>Pickup / Reset</u>
Under voltage	N&E,3 $\phi$	70 to 98%	85 to 100%
Over voltage	N&E,3 $\phi$	102 to 115%	2% below trip
Under frequency	N&E	85 to 98%	90 to 100%
Over frequency	N&E	102 to 110%	2% below trip
Voltage unbalance	N&E	5 to 20%	1% below dropout

- B. Repetitive accuracy of all settings shall be within  $\pm 0.5\%$  over an operating temperature range of  $-20^{\circ}\text{C}$  to  $60^{\circ}\text{C}$ .
- C. Voltage and frequency settings shall be field adjustable in 1% increments, either locally with the display and keypad, or remotely via serial communications port access.
- D. The controller shall be capable (when activated by the keypad or through the serial port) of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or CBA).
- E. Source status screens shall be provided for both normal & emergency to provide digital readout of voltage on all 3 phases, frequency, and phase rotation.

### 3.03 TIME DELAYS:

- A. An adjustable time delay of 0 to 6 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Capability shall be provided to extend this time delay to 60 minutes by providing an external 24 VDC power supply.
- B. A time delay shall be provided on transfer to emergency, adjustable from 0 to 60 minutes, for controlled timing of transfer of loads to emergency.
- C. Two time delay modes (which are independently adjustable) shall be provided on re-transfer to normal. One time delay shall be for actual normal power failures and the other for the test mode function. The time delays shall be adjustable from 0 to 60 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable.
- D. A time delay shall be provided on shut down of engine generator for cool down, adjustable from 0 to 60 minutes.
- E. A time delay activated output signal shall also be provided to drive an external relay(s) for selective load disconnect control. The controller shall have the ability to activate an adjustable 0 to 5 minute time delay in any of the following modes:
1. Prior to transfer only.
  2. Prior to and after transfer.

3. Normal to emergency only.
  4. Emergency to normal only.
  5. Normal to emergency and emergency to normal.
  6. All transfer conditions or only when both sources are available.
- F. The controller shall also include the following built-in time delays for optional Closed Transition and Delayed Transition operation:
1. 1 to 5 minute time delay on failure to synchronize normal and emergency sources prior to closed transition transfer.
  2. 0.1 to 9.99 second time delay on an extended parallel condition of both power sources during closed transition operation.
  3. 0 to 5 minute time delay for the load disconnect position for delayed transition operation.
- G. All time delays shall be adjustable in 1 second increments, except the extended parallel time, which shall be adjustable in .01 second increments.
- K. All time delays shall be adjustable by using the LCD display and keypad or with a remote device connected to the serial communications port.

### 3.04 ADDITIONAL FEATURES:

- A. A three position momentary-type test switch shall be provided for the *test / automatic / reset* modes. The test position will simulate a normal source failure. The reset position shall bypass the time delays on either transfer to emergency or retransfer to normal.
- B. A SPDT contact, rated 5 amps at 30 VDC, shall be provided for a low-voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.
- C. Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact closed, when the ATS is connected to the emergency source.
- D. LED indicating lights (16 mm industrial grade, type 12) shall be provided; one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red).
- E. LED indicating lights (16 mm industrial grade, type 12) shall be provided and energized by controller outputs. The lights shall provide true source availability of the normal and emergency sources, as determined by the voltage sensing trip and reset settings for each source.

- F. Provide the ability to select “commit/no commit to transfer” to determine whether the load should be transferred to the emergency generator if the normal source restores before the generator is ready to accept the load.
- G. Terminals shall be provided for a remote contact which opens to signal the ATS to transfer to emergency and for remote contacts which open to inhibit transfer to emergency and/or retransfer to normal. Both of these inhibit signals can be activated through the keypad or serial port.
- H. An In-phase monitor shall be provided in the controller. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The in-phase monitor shall be specifically designed for and be the product of the ATS manufacturer.
- I. The controller shall be capable of accepting a normally open contact that will allow the transfer switch to function in a non-automatic mode using an external control device.
- J. Engine Exerciser – The controller shall provide an internal engine exerciser. The engine exerciser shall allow the user to program up to seven different exercise routines. For each routine, the user shall be able to:
  - 1. Enable or disable the routine.
  - 2. Enable or disable transfer of the load during routine.
  - 3. Set the start time,
    - time of day
    - day of week
    - week of month (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, alternate or every)
  - 4. Set the duration of the run.

At the end of the specified duration the switch shall transfer the load back to normal and run the generator for the specified cool down period. A 10-year life battery that supplies power to the real time clock in the event of a power loss will maintain all time and date information.

- K. System Status – The controller LCD display shall include a “System Status” screen which shall be readily accessible from any point in the menu by depressing the “ESC” key a maximum of two times. This screen shall display a clear description of the active operating sequence and switch position. For example,

*Normal Failed*  
*Load on Normal*  
*TD Normal to Emergency*  
*2min15s*

Controllers that require multiple screens to determine system status or display “coded” system status messages, which must be explained by references in the operator’s manual, are not permissible.

- L. Self Diagnostics – The controller shall contain a diagnostic screen for the purpose of detecting system errors. This screen shall provide information on the status input signals

to the controller which may be preventing load transfer commands from being completed.

M. Communications Interface – The controller shall be capable of interfacing, through an optional serial communication module, with a network of transfer switches, locally (up to 4000 ft.) or remotely through modem serial communications. Standard software specific for transfer switch applications shall be available by the transfer switch manufacturer. This software shall allow for the monitoring, control and setup of parameters.

N. Data Logging – The controller shall have the ability to log data and to maintain the last 99 events, even in the event of total power loss. The following events shall be time and date stamped and maintained in a non-volatile memory:

1. Event Logging

1. Data and time and reason for transfer normal to emergency.
2. Data and time and reason for transfer emergency to normal.
3. Data and time and reason for engine start.
4. Data and time engine stopped.
5. Data and time emergency source available.
6. Data and time emergency source not available.

2. Statistical Data

1. Total number of transfers.
2. Total number of transfers due to source failure.
3. Total number of days controller is energized.
4. Total number of hours both normal and emergency sources are available.

## **PART 4 ADDITIONAL REQUIREMENTS**

### **4.01 WITHSTAND & CLOSING RATINGS:**

- A. The ATS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the ATS terminals. The minimum rating shall be as shown on the drawings.
- B. The ATS shall be UL listed in accordance with UL 1008 and be labeled in accordance with that standard's 1½ and 3 cycle, ratings. ATS which are not tested and labeled with 1½ and 3 cycle (any breaker) ratings and have series, or specific breaker ratings only, are not acceptable.
- C. It shall be the ATS switch supplier's responsibility to obtain the circuit breaker data for the circuit breakers feeding the ATS and insure that the "specific breaker" ratings meet the project requirements for withstand and close. This shall apply to all ratings, i.e. short time, instantaneous, etc., depending on the overcurrent protective devices feeding the ATS from both sources.

### **4.02 TEST & CERTIFICATION:**

- A. The complete ATS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements.
- B. Upon request, the manufacturer shall provide a notarized letter certifying compliance with all of the requirements of this specification including compliance with the above codes and standards, and withstand and closing ratings. The certification shall identify, by serial number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of the submittal, shall be included in the certification.
- C. The ATS manufacturer shall be certified to ISO 9001 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, and installation and servicing in accordance with ISO 9001.

4.03 SERVICE REPRESENTATION:

- A. The ATS manufacturer shall maintain a national service organization of company-employed personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.
- B. Include startup and train owner on operation of ATS system.

END OF SECTION 16216

# CITY OF COTTONDALE GENERATOR ADDITION PROJECT

## SECTION 16216- GENERATORS

### PART 1 - GENERAL

#### 1.1 DESCRIPTION OF WORK:

Furnish all labor, materials, equipment and incidentals required putting into operation and field test Generator units and appurtenances shown on the Drawings and specified herein. The units shall be rated to operate all motors shown on the drawings plus all auxiliary electrical equipment.

These Specifications are intended to give a general description of what is required, but do not cover all details which will vary in accordance with the requirements of the equipment as offered. It is, however, intended to cover the furnishing, the shop testing, and delivery and complete installation and field testing, of all materials, equipment and appurtenances as herein specified, whether specifically mentioned in these Specifications or not.

#### 1.2 DESCRIPTION OF SYSTEMS:

The generator unit shall be arranged for automatic starting and stopping, and load transfer upon failure of the normal source of power. The unit controls shall provide for automatic exercising on a weekly basis.

#### 1.3 QUALIFICATIONS:

The engine-generator set shall be the standard product, as modified by these Specifications, of Caterpillar, Cummins, Generac, Taylor Power Systems, or Kohler. Manufacturer shall ensure units with start and run loads shown on the plans. Upsized alternators may be required to start and run the loads shown on the plans. The unit shall be of proven ability and shall be designed, constructed, and installed in accordance with the best practices and methods.

The unit must be of such physical dimensions as to make a good installation in the opinion of the Engineer, in the space provided as indicated on the Drawings.

The unit shall be assembled in the U.S. with over 50% of the components such as the engine, generator, auxiliary equipment, etc., manufactured in the U.S. by a manufacturer currently engaged in the production of such equipment.

An authorized distributor having a parts and service facility within a 250-mile radius of the job site shall ship the unit to the job site. In addition, and in order not to penalize the Owner for unnecessary or prolonged periods of time for service or repairs to the emergency system, the engine generator set supplier must have no less than eighty percent (80%) of all engine replacement parts locally available at all times. Certified proof of this replacement shall be

furnished to the Engineer upon request.

All materials and parts comprising the units shall be new and unused, of current manufacture, and of the highest grade, free from all defects or imperfections. Equipment shall not have been in prior service except as required by factory tests. Workmanship shall conform to the best modern practices. Only new and current models will be considered. The units offered under these Specifications shall be the product of a firm regularly engaged in the production of engine-generator equipment and shall meet the requirements of the Specifications set forth herein. Major exceptions to Specifications will be considered sufficient cause for rejection of the machine. All equipment furnished under this Specification shall be the standard product of a manufacturer having a successful record of manufacturing and servicing the equipment and systems specified herein for of five (5) years minimum.

#### 1.4 SUBMITTALS:

Submit to the Engineer for approval complete sets of installation drawings, schematics, and wiring diagrams which show details of installation and connections to the work of other Sections, including foundation drawing showing location and size of foundation bolts for the spring type vibration isolators and brochures covering each item of equipment.

In the event that it is impossible to conform to certain details of the Specifications due to different manufacturing techniques, describe completely all nonconforming aspects.

The submittal data for each unit shall include, but not necessarily be limited to, the following:

1. Installation drawings showing plan and elevations of the complete generator unit; weatherproof housing; foundation plan; exhaust silencer; starting battery; battery charger; fuel tank; and all other items requiring space for installation.
2. Certificate(s) within 30 days after award certifying that not less than two engines of identical number of cylinders and cylinder size, identical rotational speed, and identical or higher BMEP, and of the same basic configuration (in-line or "V") as the engine to be furnished, shall have driven generators which have produced in satisfactory operation not less than 1,000 kW hours of electricity within a two year period.
3. Construction drawings showing outline, general arrangement (setting Plan), and anchor bolt details. Drawings shall show the total weight and center of gravity of the assembled equipment on the mounting skid.
4. Piping schematics for fuel oil, lubricating oil, jacket water, and cooling water integral with the engine.
5. Battery sizes and cranking time calculations.
6. Battery charger and block heater electrical power requirements and connections. The battery charger and block heater shall be 120VAC with expected block heater load no larger than

1500kW.

7. Critical speed calculations.

Engine Data:

- a. Manufacturer
- b. Model
- c. Number of cylinders
- d. RPM
- e. Bore x stroke
- f. BMEP at full rated load
- g. Fuel consumption rate curves at various loads
- h. Gross engine horsepower to produce generator standby rating (including fan and all parasitic loads)

Generator Data:

- a. Manufacturer
- b. Model
- c. Rated KVA
- d. Rated kW
- e. Voltage
- f. Temperature rise above 40 degree C ambient:
  - (1) Stator by thermometer
  - (2) Field by resistance
  - (3) Class of insulation
- g. Generator efficiency including excitation losses and at 80 percent power factor:
  - (1) Full load
  - (2) 3/4 Load
  - (3) 1/2 Load

Generator Unit Control Data:

- a. Actual electrical diagrams including schematic diagrams, and interconnection wiring diagrams for all equipment to be provided.
- b. Legends for all devices on all diagrams.
- c. Sequence of operation explanations for all portions of all schematic-wiring diagrams.

8. Alternator Data Sheet

Furnish Manufacturer's certified shop test record of the complete engine driven generator unit.

#### 1.5 OPERATING INSTRUCTIONS:

Operating and maintenance manuals shall be furnished. The manuals shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions, etc. that are required to instruct operation and maintenance personnel unfamiliar with such equipment. At job closeout submit 3 copies of operation and maintenance manuals for equipment. Identification symbols for all replaceable parts and assemblies shall be included. Information in manuals shall be comprehensive and specific.

A factory representative of the generator unit manufacturer who has complete knowledge of proper operation and maintenance shall be provided for one day to instruct representatives of the Owner and the Engineer on proper operation and maintenance. With the Owner's permission, this work may be conducted in conjunction with the inspection of the installation and test run as provided under PART 3 - EXECUTION. If there are difficulties in operation of the equipment due to the manufacturer's design or fabrication, additional service shall be provided at no cost to the Owner.

#### 1.6 SPECIAL TOOLS AND SPARE PARTS:

The manufacturer shall furnish any special tools required for normal operation and maintenance of the equipment being furnished.

The manufacturer shall furnish two (2) complete spare replacement sets of all filter elements required for the generator unit.

#### 1.7 PRODUCT HANDLING:

All parts shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the units and equipment are ready for operation.

All equipment and parts must be properly protected against any damage during a prolonged period at the site.

Factory assembled parts and components shall not be dismantled for shipment unless permission is received in writing from the Engineer.

Finished surface of all exposed openings (exhaust, etc.) shall be protected by wooden blanks, strongly built and securely fastened thereto.

Finished iron or steel surfaces not painted shall be properly protected to prevent rust and corrosion.

Proper care shall be taken to protect parts from the entrance of water during shipment, storage, and

handling.

Each box or package shall be properly marked to show its net weight in addition to its contents.

#### 1.8 WARRANTY:

The contractor and the equipment manufacturers shall warrant all equipment supplied under this section for a period of two (2) years. Warranty period shall commence on Final Completion Date.

The equipment shall be warranted to be free from defects in workmanship, design and materials. If any part of the equipment should fail during the warranty period, it shall be replaced in the machine and the unit restored to service at no expense to the Owner.

The manufacturer's warranty period shall run concurrently with the Contractor's warranty period. No exception to this provision shall be allowed.

## **PART 2 - PRODUCTS**

#### 2.1 STANDARD COMMERCIAL PRODUCT:

Generator set shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product with any added features needed to comply with the requirements. Additional or better features which are not specifically prohibited by this Specification, but which are a part of the manufacturer's standard commercial product shall be included in the generator set being furnished. A standard commercial product is a product, which is or will be sold on the commercial market through advertisements or manufacturer's catalogs, or brochures, and represents the latest production model(s).

#### 2.2 RATINGS:

The rating of the generator set shall not exceed the manufacturer's published standby rating. The gross engine horsepower required to produce the standby rating shall not exceed the manufacturer's published continuous duty rating by more than 150 percent. The gross engine horsepower described shall include all parasitic demands such as generator inefficiencies, fuel pumps, water pumps, radiator fan (for fan cooled models) and all accessories necessary to the unit's proper operation while operating at rated load and at a rotational speed not to exceed 1800 rpm. Generator set shall have a net continuous standby rating as indicated on the Drawings or required to start and run the loads shown on the drawings. The net kW rating of the generator set shall be defined while operating the unit at 1800 RPM with the generator set equipped with all necessary operating accessories including alternating current generator and exciter, air cleaner(s), oil pump, fuel pump, fuel injection pump, jacket water pump, radiator fan, exhaust system, and battery charging alternator.

**Note:**

The above stated requirements may require a generating set with a larger than indicated nominal rating. Site conditions for this project are an elevation of not greater than 200 feet above mean sea level and an atmospheric temperature of 104 degrees F burning #2 diesel fuel oil.

The generator set shall be capable of producing the specified standby kW rating for continuous electrical service during interruption of the normal utility source and shall be certified to this effect by the manufacturer for the actual unit supplied.

Three phase Generator Unit kW rating shall be at 0.8 power factor and single phase shall be at 1.0 power factor.

Generator sets shall conform to the requirements of NFPA 37, 110, and NEMA MG1-22.40.

### 2.3 GENERATOR SET AND AUXILIARY EQUIPMENT:

The generator set shall consist of a diesel engine connected to an alternating current generator with Permanent Magnet excitation system.

The generator set shall be arranged for automatic unattended starting.

Critical speeds: The complete generator set shall be free of critical speeds of either a major or minor order that will endanger satisfactory operation of the set. Satisfactory operation will be considered endangered if torsion vibration stresses exceed 5,000 psi within 10% above or below rated engine speed.

Rotating or reciprocating parts or other parts that may present a hazard to operating personnel shall be isolated or shielded to minimize danger. Design Characteristics shall limit operating temperatures at critical points of maximum wear at full-load operating conditions.

### 2.4 ENGINES:

The engine shall be a full compression ignition, four cycle, naturally aspirated, turbocharged, turbocharged-intercooled, single acting, solid injection engine, either vertical in-line or "V" type. Engine shall be designed and constructed so as to eliminate undue heating, vibration, and wear. Speed shall not exceed 1800 revolutions per minute at normal full load operation. The engine governor shall maintain frequency regulation not to exceed 3 percent (1.8 Hertz) from no load to full rated load and shall have a Vernier control with positive locking mechanism for manual operation and adjustment. Engine shall be constructed adequately to withstand sudden changes from no load to rated load, and to preserve alignment of integral components under all conditions of operation. Engine shall be neat in appearance and shall permit easy access to various parts for maintenance purposes.

Assembly: Completely factory assemble engine. Mount turbocharger, intercooler if provided, and all piping integral with the engine, on the engine.

Radio-Interference Suppression: The engine shall comply with MIL-I-16165 relative to radiated radio interference.

Generators and other devices capable of producing radio interference shall comply with MIL-STD-461 relative to radiated and conducted radio interference.

Engine Speed Governing System: Governing system shall be suitable for controlling the speed of the generator set within the requirements specified herein without intermediate adjustment and shall maintain the specified stability without hunting or cycling.

Overspeed Shutdown Device: The overspeed shutdown device shall be entirely independent of the engine speed governing system and shall be positive engaged so that engine speed shall not exceed 110 percent of synchronous speed, and shall react to shut off the engine's air and fuel supply. The overspeed device shall require manual resetting after emergency tripping.

The engine shall be capable of satisfactory performance on No. 2 fuel oil (ASTM Designation D396) (diesel units). Diesel engines requiring a premium fuel will not be considered.

The engine shall be capable of operating at light loads for extended periods of time and shall provide a means to reduce carbonization (wet stacking).

The engine shall be equipped with fuel filters, lube oil filters, intake air filters, lube oil cooler, fuel transfer pump, fuel priming pump, service meter, engine driven water pump, and unit mounted instruments. Unit mounted instruments shall include a fuel pressure gauge, water temperature gauge, and lubrication oil pressure gauge. The engine shall be provided with low oil pressure, high water temperature and overspeed safety shutdowns of the manual reset type.

A mechanical fuel injection system shall be employed. Injection pumps and injection valves shall be a type not requiring adjustment in service and shall be of a design allowing quick replacement by ordinary mechanics without special experience. The engines shall have an individual mechanical injection pump and injection valve for each cylinder, any one of which may be removed and replaced from parts stock. Fuel injection pumps shall be positive action, constant-stroke pumps, activated by a cam driven by gears from the engine crankshaft. Fuel lines between injection pumps and valves shall be of heavy seamless tubing.

The fuel system shall be equipped with fuel filters having replaceable elements. Filter elements shall be easily removable from their housing for replacing without breaking any fuel line connections, or disturbing the fuel pump, or any other part of the engine. All fuel filters shall be conveniently located in an accessible housing, ahead of the injection pumps so that the fuel will have been thoroughly filtered before it reaches the pump. No screens or filters requiring cleaning or replacement shall be used in the injection pump or injection valve assemblies. The engines shall be equipped with a built-in gear-type, engine-driven fuel transfer pump, capable of supplying fuel through the filters to the injection pump at constant pressure.

In addition to the standard fuel filters provided by the engine manufacturer, there shall also be

installed a primary fuel filter and a water separator in the fuel inlet line to the engine.

The engine shall be provided with removable wet-type cylinder liners of close grained alloy iron, heat treated for proper hardness as required for maximum liner life.

The engine shall have a gear-type lubricating oil pump for supplying oil under pressure to main bearings, crank pin bearings, pistons, piston pins, timing gears, camshaft bearings, valve rocker mechanism and governor. Effective lubricating oil filters shall be provided and so located and connected that all oil being circulated is continuously filtered and cleaned. The engine shall have a suitable water-cooled lubricating oil cooler. The crankshaft shall incorporate drilled passages for pressure lubrication of bearings. And the journals shall be hardened or chromium plated to provide a hard shock resistant surface with ductile core. Crankshaft and connecting rod bearings shall be replaceable precision sleeve type.

The piston rings shall be constructed of heat-resistant alloy steel or chromium plated cast iron. Camshafts shall be gear or chain driven, and shall have higher wear resistance at cams and journals. Timing marks shall be clearly indicated on the crankshaft and gears. The flywheel shall be balanced, and shall be capable of being rotated 50 percent above the maximum rated engine rotational speed without danger of breaking or exploding. Flywheel housing shall be provided with a drain hole at the lowest point. Means for turning the crankshaft manually shall be provided.

The engine shall be provided with one or more engine mounted dry type air cleaners of sufficient capacity to protect effectively the working parts of the engine from dust and grit.

## 2.5 ENGINE LUBRICATING OIL SYSTEM:

Provide unit with a full pressure lubricating system arranged to distribute oil to all moving parts of the engine and to cool the pistons. System shall include an engine-driven positive displacement pump, pressure regulating valves, oil filter, oil pressure indicator, and the necessary piping and fittings. The pump shall have ample capacity to circulate the lubricating oil required for engine lubrication and to cool the pistons. All necessary stop, check, pressure relief, and pressure control valves shall be provided.

Lubricating Oil Filters: Shall be the full-flow type (throwaway type) and shall be capable of filtering the full rate of oil flow of the oil pump at maximum engine speed. Means shall be provided to ensure delivery of lubricating oil to vital wearing surfaces regardless of the condition of the filter. Filters shall be accessible, easily removed and cleaned and shall be equipped with a spring-loaded by-pass valve as an insurance against stopping of lubricating oil circulation in the event the filters become clogged.

Lubricating Oil Coolers: Provide to maintain the lubricating oil within the temperature limits recommended by the manufacturer. Oil cooler shall utilize the engine jacket cooling water from the radiator as the cooling medium.

## 2.6 COOLING SYSTEMS:

The engine shall be furnished with a unit mounted radiator- type cooling system. The radiator fan shall direct the airflow from the engine outward through the radiator, with horizontal air discharge. The fan shall be driven directly from the engine crankshaft or through V-belt drive. The radiator shall have sufficient capacity to dissipate not less than the total British Thermal Units per hour rejected by the engine to the cooling system at 110 percent rated load in 110°F ambient, and against a static restriction of 0.5 inch of water. The cooling section shall have a tube and fin type core which shall consist of copper or copper base alloy tubes with nonferrous fins. The radiator filler cap shall be designed for pressure relief prior to removal. A coolant overflow container shall be provided.

A modulating thermostatic control valve shall be installed in the jacket water system of the engine to maintain the water system optimum temperature of the engine. The valve shall be capable of passing the water flow as determined by the manufacturer without excessive pressure drop across the valve. The valve shall be designed so that if the thermostatic element fails, water will be able to flow through the engine.

One unit mounted thermal circulation type water heater incorporating an adjustable thermostatic switch shall be furnished to maintain engine jacket water at 70 to 100 degrees F. The heater shall be at the specified voltage on the plans and single phase.

Engine shall be delivered with adequate antifreeze for protection at 0°F. Closed circuit jacket water systems shall be treated with a rust inhibitor as recommended by the engine manufacturer.

## 2.7 ENGINE FUEL SYSTEM:

The engine shall be provided with all necessary equipment, including piping, fittings, valves, filters (throwaway type), strainers and appurtenances.

Provide a Double Wall Base mounted fuel tanks for diesel units, with capacity in gallons to operate the unit at full load for 24 hours, complete with fuel level gauge and screw on fuel filler cap. Provide Tank Level indicator with two low level switches for remote tank level indication. Tank shall be primed and painted with two heavy coats of enamel. Tank shall meet all requirements of the Florida Administrative Code Chapter 62-762.

**The Contractor is responsible for fuel for testing and startup and shall fill fuel tank with #2 fuel oil after testing.**

## 2.8 EXHAUST SYSTEMS:

Provide a complete exhaust system, including exhaust flexible connection and silencer.

Exhaust silencer shall be provided for the engine of the size recommended by the manufacturer. Silencer shall be suitable for residential silencing. Silencer shall be furnished and mounted by the manufacturer.

All exhaust equipment must be rated to withstand temperatures of approximately 1,000 degrees F. A flexible stainless steel pipe connection shall be provided between the engine exhaust stack and exhaust piping. One silencer rain cap with counter weight shall be provided for the unit.

## 2.9 ENGINE AIR INDUCTION SYSTEM:

The air induction system shall be equipped with heavy-duty dry type air cleaners of adequate capacity to effectively remove the dirt and abrasives from the combustion air to the engine.

Turbocharger shall be a combination centrifugal blower driven by an exhaust gas turbine, with the air blower directly connected to the intake air manifold. Systems that require cooling of the intake air below ambient air temperature ahead of the turbocharger or scavenger air blower will not be acceptable. A reliable Lubrication System for the turbocharger shall be provided. All necessary supports and connections shall be provided.

## 2.10 AUTOMATIC STARTING SYSTEM:

NEMA ICS 1 and NEMA ICS 2. A DC electric positive engagement type cranking system shall be furnished, capable of rotating the engine at a speed sufficient for rapid starting in an ambient temperature of 10°F. The system shall be arranged to permit starting of the engine automatically upon signal from the automatic transfer switch.

**Cranking:** The electric cranking system shall utilize a 24 volt direct current (dc) electrical circuit, with the negative polarity grounded, energized by storage batteries. The cranking motor shall be of the heavy-duty type with adequate capacity to crank the engine continuously to start the engine in an ambient temperature of 10 degrees F.

The drive mechanism for engaging the starting motor with the engine flywheel shall be designed to inherently engage and release without binding. When the engine starts, a "stop cranking" switch, which is engine speed actuated, shall cause disengagement of the starting gearing and the shutdown of the starting motor. If the engine fails to crank after three consecutive cranking cycles lockout shall occur. On lockout an alarm shall sound and an "OVERCRANK" light shall illuminate which shall remain lighted until it is manually reset.

**Starting Aids:** A jacket water heating system shall be provided to ensure starting. The heater shall be thermostatically controlled at the temperature recommended by the engine manufacturer. Power leads shall be brought to a junction box. The junction box shall be mounted on the engine base.

**Storage Battery:** The engine cranking battery shall be S.A.E. Type "D", diesel engine starting type (for diesel units) and of sufficient size and capacity in a fully charged condition to start the engine-generator six consecutive times at 10 degrees F without recharging between cranks

**Battery Charger:** The battery charger shall be enclosed, mounted in the weatherproof housing,

automatic, dual rate, solid-state, constant voltage type having ac voltage compensation, dc voltage regulation, and current limiting. The charger shall employ transistor-controlled magnetic amplifier circuits to provide continuous taper charging. Charger shall have two ranges, float and equalize, with 0-24 hour equalizer time, dc cranking relay, silicon diode full-wave rectifiers, automatic surge suppressors, dc ammeter, dc voltmeter, and fused inputs and outputs. Charger shall have a continuous rated output of not less than 10 amps. Battery charger shall conform to UL 1236.

Battery Charging Alternator: Provide a V-belt driven, from the engine, 35amp minimum-rated battery-charging alternator complete with a solid- state voltage regulator.

## 2.11 SAFETY SHUTDOWN CONTROLS AND ALARMS:

Control shall be provided that will function to immediately shut off delivery of fuel to the engine cylinders when actuated by a condition of low lubricating oil pressure, high water temperature, overspeed, or low water level. The values at which the controls for low lubricating oil pressure and high water temperature are actuated shall be as recommended by the manufacturer, and the overspeed governor shall be set to actuate at the value specified herein. The low lubricating oil pressure shutdown control shall be provided with a means to make it inoperative during the period of low oil pressure when the engine is started. Each shutdown shall initiate its individual light, close a 120VAC rated contact and sound an alarm within the cranking panel, and shall require manual reset. Normal start-up and shutdown shall not actuate the safety shutdown and alarm indicator system.

Furnish Emergency Stop switch as required by code.

Audible Annunciator: Provide audible annunciators mounted on the genset for engine-generator sets with light emitting diode (LED) indicators. Annunciators shall include the following:

1. Control switch not in Auto position
2. Overcrank
3. Low lube oil pressure
4. High coolant temperature
5. Low coolant temperature
6. Overspeed
7. Low fuel main tank
8. High coolant temperature pre-alarm
9. Low lube oil pressure pre-alarm

## 2.12 GENERATORS AND EXCITATION SYSTEMS:

Generators: The generator shall be three-phase, 60 hertz alternating-current type with revolving field. The speed of the generator shall be 1800 rpm. Enclosures shall be sound attenuating weatherproof aluminum and wind rated to 150 mph. The generator shall conform to ANSI C50.10, and to NEMA MG-1. The generator shall have form-wound stator and rotor coils with Class H insulation. The rotor and stator shall have a maximum temperature rise, as measured by the

resistance method, suitable for Class H insulation in accordance with NEMA Standard MG1-22.4. The generator and flywheel shall have sufficient flywheel effect to meet the requirements of regulation and operation as specified. The generator rotor shall be coupled directly to the engine flywheel through a flexible drive disc. Impellers shall be mounted on the rotor for cooling the generator. The rotor shall be capable of safe operation at a speed 25 percent in excess of its rated synchronous speed. The generator armature, field, and ground leads shall have clamp or crimp-type lugs or connectors for electrical connections. Terminal markings shall conform to NEMA MG-1.

Excitation and Voltage Regulation System: The excitation system shall be the Permanent Magnet type. The system shall serve as an individual excitation and regulation system for the generator specified herein, and there is no requirement for parallel operation with other exciters. The excitation system shall have a continuous current rating of not less than the generator excitation current required when the generator operates at 105 percent rated voltage under the condition of continuous rating requiring maximum field current. The voltage rating of the system shall be as required to match the generator field requirements. The exciter insulation shall be Class H. The excitation system response ratio shall be not less than 0.5 and the ceiling voltage shall be not less than 120 percent of rated voltage.

Voltage Regulator: The voltage regulator shall be a completely solid-state type for control of generator voltage by control of the exciter field. The regulator shall control the generator exciter field as required to maintain a constant and stable generator output voltage within plus or minus 2 percent of nominal for all steady-state loads from no load to full load, including a 5 percent variation in frequency and the effects of field heating. Electromagnetic interference suppression shall be an integral part of the regulator. Thermal protection for power semiconductors, inherent over voltage protection, and fuse protection shall be provided internally in the regulator. No electrolytic capacitors, vacuum tubes, or electromechanical relays shall be used in the voltage regulator.

## 2.13 GENERATOR CONTROL PANEL:

Engine-Generator Instruments and Controls: NEMA ICS 1, 2, 3, 4, and 6.

Engine Instruments: Include the following as minimum components:

1. Lubricating Oil Pressure Gauge: Shall be indicating dial type accurate to within 2 percent of full-scale reading.
2. Coolant Temperature Indicators: Shall be indicating dial type accurate to within 2 percent of full-scale reading.
3. Running Time Meter: Totalize engine running time to 9999.9 hours total.
4. Generator Controls and Instruments: NEMA ICS 1, 2, 3, and 4 and shall include the components listed below. Instruments shall comply with ANSI c39.1.
  - a. Voltmeter, Ammeter and Frequency Meters: Shall be indicating dial type, not less than 3-1/2 inch nominal round or square with accuracy of 2 percent

- of full scale.
- b. Control Switches: Voltage and ampere ratings suitable for the intended use.
- c. Voltage adjustment rheostat.
- d. Panel lights and control switch.
- e. Alarm indicating panel.

An output Circuit Breaker shall be installed for the generator unit and sized as noted on the plans to insure coordination with the specified field wiring, equipment, and ATS switch rating.

#### 2.14 TREATMENT AND PAINTING:

All parts, including engine subject to high temperature, shall be treated, and painted in accordance with manufacturer's standards.

The generator and all associated electrical equipment shall be thoroughly cleaned and treated prior to painting. Color shall be manufacturer's standard.

#### 2.15 BASE ASSEMBLY:

Engine-Generator: Shall be mounted on a fabricated steel Double Wall Base Tank suitable for supporting, transporting, and skidding engine and generator without damage to equipment or alignment for diesel units.

Vibration Isolators: The engine-generator shall be provided with suitable spring-type vibration isolators between the engine and its concrete foundation.

#### 2.16 OUTDOOR WEATHER PROTECTIVE SOUND ATTENUATED ENCLOSURE:

The generator set shall be provided with an outdoor enclosure, with the entire package listed under UL2200. The package shall comply with the requirements of the National Electrical Code for all wiring materials and component spacing. The total assembly of generator set, enclosure, and sub-base fuel tank (when used) shall be designed to be lifted into place using spreader bars.

Housing shall provide ample airflow for generator set operation at rated load in an ambient temperature of 104F.

Housing shall be rated for minimum 150 mph wind gust or as required by the Florida Building Code for Jackson County if higher requirement.

The housing shall have hinged access doors as required to maintain easy access for all operating and service functions. All doors shall be lockable and include retainers to hold the door open during service. Enclosure roof shall be cambered to prevent rainwater accumulation.

Openings shall be screened to limit access of rodents into the enclosure.

All electrical power and control interconnections shall be made within the perimeter of the enclosure.

All sheet metal shall be primed for corrosion protection and finish painted with the manufacturers' standard color using a two step electro coating paint process, or equal meeting the performance requirements specified below. All surfaces of all metal parts shall be primed and painted. The painting process shall result in a coating that meets the following requirements:

Primer thickness, 0.5-2.0 mils. Top coat thickness, 0.8-1.2 mils.

Gloss, per ASTM D523-89, 80% plus or minus 5%. Gloss retention after one year shall exceed 50%.

Crosshatch adhesion, per ASTM D3359-93, 4B-5B.

Impact resistance, per ASTM D2794-93, 120-160 inch-pounds.

Salt Spray, per ASTM B117-90, 1000+ hours.

Humidity, per ASTM D2247-92, 1000+ hours.

Water Soak, per ASTM D2247-92, 1000+ hours.

Painting of hoses, clamps, wiring harnesses, and other non-metallic service parts shall not be acceptable. Fasteners used shall be corrosion resistant and designed to minimize marring of the painted surface when removed for normal installation or service work.

Enclosure shall be constructed of aluminum. All hardware and hinges shall be stainless steel.

A factory-mounted exhaust silencer shall be installed inside the enclosure. The exhaust shall exit the enclosure through a rain collar and terminate with a rain cap. Exhaust connections to the generator set shall be through seamless flexible connections.

The enclosure shall include the following maintenance provisions:

Flexible coolant and lubricating oil drain lines that extend to the exterior of the enclosure, with internal drain valves

External radiator fill provision.

The generator set shall be provided with a sound-attenuated housing which allows the generator set to operate at full rated load in an ambient temperature of up to 104F.

The enclosure shall reduce the sound level of the generator set while operating at full rated load to a maximum of 75 dBA at any location 7 meters from the generator set in a free field environment.

The enclosure shall be insulated with non-hydroscopic materials.

## PART 3 - EXECUTION

### 3.1 INSTALLATION:

Installation shall conform to the requirements of NFPA 70.

Install generator unit as indicated on Drawings.

The generator manufacturer shall supply the services of a factory representative to check over the completed generator installation, who will provide certification that the installation meets the approval of the manufacturer.

### 3.2 INSPECTION AND TESTING:

**Prior to acceptance of the installation, equipment shall be tested to show it is free of any defects and will start automatically to be subjected to full load test using portable dry type load banks supplied for this purpose at the job site by the generator set factory representative.**

The generator set factory representative shall perform all field tests, trial operations, and conduct all field inspections. The Contractor shall provide all labor, equipment, and incidentals required for the tests performed by the generator set supplier, including water, fuel, and lubricants. The only exception is the load banks, which are to be furnished by the generator set supplier.

The Owner and/or Owner's representative shall witness all field tests, trial operations, and conduct final field inspections. The Contractor shall give the Owner ample notice of the dates and times scheduled for tests, trial operations, and inspections requiring the presence of the Owner. All deficiencies found shall be rectified and work affected by such deficiencies shall be completely re-tested at the Contractor's expense. A qualified Factory Representative shall assist the Contractor with the field checkout, start-up, and test. Field tests shall include the following:

1. Demonstrate proper operation of all systems.
2. Simulate power failure and demonstrate complete automatic start, load, unload, by-pass, and stop sequence.
3. Conduct 3-hour load test using generator supplier furnished portable load banks as follows:
  - a. 1/2 load--1 hour
  - b. Full load--2 hours

The load bank shall be capable of definite and precise incremental loading and shall not be dependent on the generator control instrumentation to read amperage and voltage of each phase. The test instrumentation will serve as a check of the generator set meters. Readings will be taken and recorded at no longer than 30-minute intervals during the test and at each occurrence of a load change.

Load bank testing shall be done in the presence of the Owner and the Engineer only after the unit is permanently installed in accordance with the plans and Specifications.

3.3 JOB CLOSE-OUT:

At job closeout, perform the following:

1. Clean all equipment and accessories thoroughly.
2. Touchup all scratches and nicks with paint provided by the manufacturer for that purpose.
3. Top off fuel tank (diesel units).

END OF SECTION 16216

# COTTONDALE CRITICAL FACILITIES GENERATOR PROJECT

## SECTION 16440 - PANELBOARDS

### PART 1 - GENERAL

#### 1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals required and install all panelboards as shown on the Drawings and as specified herein.
- B. All panelboard wiring shall include wiring numbers and terminal point numbers cross referenced to shop drawing and subsequent record drawing submittals.

#### 1.2 SUBMITTALS

- A. Submit to the ENGINEER, in accordance with Section 01330, shop drawings and product data, for the following as a minimum:
  - 1. Equipment outline drawings showing elevation and plan views, dimensions and weight. Indicate all options, special features, ratings, and deviations from this Section.
  - 2. Bus arrangement drawings.
  - 3. Product data sheets and catalog numbers for circuit breakers, etc. List all options, trip adjustments and accessories furnished specifically for this project.
  - 4. Instruction and renewal parts books.
  - 5. Test and inspection reports.
  - 6. Complete bill of materials list.
  - 7. The equipment drawings, summary tables, and bill of materials list shall be computer generated (i.e. no hand-drawn drawings, sketches, lists will be accepted).

#### 1.3 REFERENCE STANDARDS

- A. Panelboards shall be in accordance with the Underwriter Laboratories (UL) "Standard for Panelboards" and "Standard for Cabinets and Boxes" and shall be so labeled where procedures exist. Panelboards shall also comply with NEMA Standard for Panelboards and the National Electrical Code (NEC).
- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

#### 1.4 MANUFACTURERS

- A. 120/240 Volt, single phase, 3 Wire and 120/208 Volt, 3 Phase, 4 Wire panelboards shall be Type I-LINE or NQ as manufactured by Square D; Type Power-Line by Eaton; or Type Spectra or AQ by General Electric.
- B. NEMA 3R panelboards shall be as specified herein, provided in steel enclosures (NEMA 4X in stainless steel), and completely assembled by the panelboard manufacturer. The door shall be provided with a pad-lockable vault type 3-point latch with no other latches provided.
- C. Alternate suppliers must be submitted for approval to the ENGINEER in writing four weeks prior to the original bid date with supporting documentation to confirm all aspects of the specifications.

## **PART 2 PRODUCTS**

### **2.1 GENERAL**

- A. Rating
  - 1. Panelboard ratings shall be as shown on the Drawings. All panelboards shall be rated for the intended voltage.
  - 2. Circuit breaker panelboards shall be fully rated for the specified circuit breaker fault current interrupting capacity. Series connected short circuit ratings will not be acceptable.

### **2.2 MATERIALS (NEMA 1)**

- A. Interiors
  - 1. All interiors shall be completely factory assembled with circuit breakers, wire connectors, etc. All wire connectors, except screw terminals, shall be of the anti-turn solderless type and all shall be suitable for copper wire of the sizes indicated.
  - 2. Interiors shall be so designed that circuit breakers can be replaced without disturbing adjacent units and without removing the main bus connectors and shall be so designed that circuits may be changed without machining, drilling, or tapping.
  - 3. Branch circuits shall be arranged using double row construction except when narrow column panels are indicated. Branch circuits shall be numbered by the manufacturer.
  - 4. A nameplate shall be provided listing manufacturer's name, panel type and rating.
- B. Buses
  - 1. Bus bars for the mains shall be of tin plated copper. Full size tin plated copper neutral bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices. Bussing shall be braced throughout to conform to industry standard practice

governing short circuit stresses in panelboards. Phase bussing shall be full height without reduction. Cross connectors shall be tin plated copper. Each panel shall be provided with a ground bus bar, with removable link/jumper between neutral and ground bus. The ground bus shall be sized to the maximum number of circuit breakers that can be installed in the panelboard.

2. Neutral bussing shall have a suitable lug for each outgoing feeder requiring a neutral connection.
3. Spaces for future circuit breakers shall be bussed for the maximum device that can be fitted into them.
4. Tin plated copper equipment ground bars shall be furnished.

#### C. Boxes

1. Recessed or flush mounted boxes shall be made from galvanized code gauge steel having multiple knockouts, unless otherwise noted. Boxes shall be of sufficient size to provide a minimum gutter space of 4-in on all sides.
2. Surface mounted boxes and trims shall have an internal and external finish as specified in Paragraph 2.04D4 below.
3. At least four studs for mounting the panelboard interior shall be furnished.
4. All conduit entrances shall be field punched.

#### D. Trim

1. Hinged doors covering all circuit breaker handles shall be included in all panel trims.
2. Doors shall have semi flush type cylinder lock and catch, except that doors over 48-in in height shall have a vault handle and 3-point catch, complete with lock, arranged to fasten door at top, bottom and center. Door hinges shall be concealed. Furnish two keys for each lock. All locks shall be keyed alike; directory frame and card having a transparent cover shall be furnished on each door. All trims shall be door-in-door type construction.
3. The trims shall be fabricated from code gauge sheet steel.
4. All exterior and interior steel surfaces of the panelboard shall be properly cleaned and finished with ANSI Z55.1, No. 49 or 61 light gray paint over a rust-inhibiting phosphatized coating. The finish paint shall be of a type to which field applied paint will adhere.
5. Trims for flush panels shall overlap the box by at least  $\frac{3}{4}$ " all around. Surface mounted panel trims shall have the same width and height as the box. Trims shall be fastened with quarter turn clamps.

### 2.3 MATERIALS (NEMA 3R and 4X)

#### A. Interiors and Buses

1. Interiors and buses shall be as herein before specified for NEMA 1 construction.

#### B. Boxes and Covers

1. Boxes, covers and hardware shall be made from 316 stainless steel with natural finish.
2. Boxes and covers shall have continuous welded seams and shall be hinged (piano type) together and gasketed.
3. Conduit openings shall be tapped.
4. Maintain NEMA rating with all penetrations in the field.

## 2.4 CIRCUIT BREAKERS

- A. Panelboards shall be equipped with circuit breakers with frame size and trip settings as shown on the Drawings.
- B. Circuit breakers shall be molded case, bolt-in type. Furnish electronic trip units where indicated on the plans with fully adjustable trip functions as indicated.
- C. Each circuit breaker used in 120/240 Volt and 120/208 Volt panelboards shall have an interrupting capacity of not less than shown on the plans.
- D. GFCI (ground fault circuit interrupter) shall be provided for circuits as required and where indicated the Drawings. GFCI units shall be 1 Pole, 120 Volt, molded case, bolt-on breakers, incorporating a solid state ground fault interrupter circuit insulated and isolated from the breaker mechanism. The unit shall be UL listed Class A Group I device (5 milliamp sensitivity, 25 millisecond trip time).
- F. Circuit breakers shall be manufactured by the panelboard manufacturer.

## **PART 3 EXECUTION**

### 3.1 INSTALLATION

- A. Mount boxes for surface mounted panelboards so there is at least 1/2-in air space between the box and the wall.
- B. Connect panelboard branch circuit loads so that the load is distributed as equally as possible between the phase busses. Record normal base load phase voltages and currents for each phase and the total neutral current and submit to the ENGINEER for review.
- C. Install markers on the front cover of all panelboards which identify the voltage rating. Markers shall be made of self-sticking B-500 vinyl cloth printed with black characters on an Alert Orange background, 2-1/4-in high by 9-in wide, Style A as manufactured by W.H. Brady Co. or equal.

- D. Install a 1-in by 3-in nominal laminated plastic nameplate with 1/2-in white letters on a black background on each panelboard. Nameplate lettering shall be as shown on the Drawings. Nameplates shall be stainless steel screw mounted.
- E. Unless otherwise noted on the Drawings, top of cabinets shall be mounted 6 feet-0-inch above the floor, properly aligned and adequately supported independently of the connecting raceways.
- F. All wiring in panelboards shall be neatly formed, grouped, and identified to provide a neat and orderly appearance. A typewritten directory card identifying all circuits shall be placed in the card holder inside the front cover.
- G. All panelboards shall be protected from physical damage, water damage, moisture, corrosion, dirt and dust during construction. Any panelboard judged to be unacceptable by the ENGINEER shall be replaced by the CONTRACTOR at no additional cost to the OWNER.
- H. Standard factory testing shall be performed for the equipment furnished under this section and these tests shall be in accordance with the latest version of NEMA and UL standards. Certified copies of these tests shall be provided to the ENGINEER upon request.
- I. Field testing and commissioning shall be done in accordance with the latest revision of the "Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems" published by the International Electrical Testing Association (NETA Standard ATS-2007) unless otherwise modified by this Section.

### 3.2 CLEANING

Remove all rubbish and debris from inside and around the equipment. Remove dirt, dust or concrete spatter from the interior and exterior of the equipment using brushes, vacuum cleaner or clean lint-free rags. Do not use compressed air.

END OF SECTION 16440

# CITY OF COTTONDALE GENERATOR ADDITION PROJECT

## SECTION 16450 - GROUNDING

### PART 1 - GENERAL

#### 1.1 SCOPE OF WORK:

The work required under this section of the specifications consists of the installation of the complete grounding system for the project. Provide all materials required for the grounding system under this section of the specifications.

#### 1.2 RELATED WORK:

Coordinate installation of grounding system with all work required under Division 16.

#### 1.3 APPLICATION:

Equipment grounding conductors shall be used to establish grounding of the entire system.

Equipment grounding shall not be by metallic raceway alone.

Table 250-66 of the NEC shall be used to size all grounding electrode conductors.

Table 250-122 of the NEC shall be used to size equipment grounding conductors.

### PART 2 - PRODUCTS

#### 2.1 GROUND RODS:

Ground rods shall be 3/4" X 10', regular or sectional as required, unless indicated otherwise.

Construction shall be a solid steel core with a heavy uniform covering of electrolytic copper.

Threads, on sectional rods, shall be rolled (not cut) into the composite metal after the copper covering has been applied.

Copper covering shall be work hardened by drawing rods.

Sectional rod couplings shall be of a corrosion resistant alloy.

## 2.2 GROUNDING ELECTRODE CONDUCTOR CONNECTIONS:

Conductor connections shall be by UL approved exothermic weld.

## 2.3 EQUIPMENT GROUNDING CONDUCTORS:

Equipment grounding conductors shall be green with XHHN-2 insulation (See Section 16120 - Wires and Cables).

## **PART 3 - EXECUTION**

### 3.1 INSTALLATION:

Ground all non-current carrying metal parts of the electrical system to provide a low impedance path for ground fault current.

The neutral conductor(s) of the incoming electrical service shall be grounded to the ground rod system, metal cold water piping system, and structural steel using Table 250-66 of the NEC for conductor sizing. Grounding conductors shall be run in rigid non-metallic conduit.

Bond generator frames, rebar in genset foundation, equipment racks to grounding system per the NEC.

Ground the neutral of all dry type and liquid filled transformers to effectively grounded metal cold water piping system or grounding electrode as near as practicable using Table 250-66 of the NEC to size conductor.

Grounding conductors shall be attached to equipment with a bolt or sheet metal screw used for no other purpose. Use crimp on spade lugs for stranded conductors.

Ensure main bonding jumper is only installed at the service disconnect. Remove any existing main bonding jumpers installed downstream of the new proposed service disconnects to ensure there is only one neutral to ground bond and it is at the service disconnect.

END OF SECTION 16450

# COTTONDALE CRITICAL FACILITIES GENERATOR PROJECT

## SECTION 16709 – SURGE PROTECTIVE DEVICES

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

The specified unit shall provide effective high energy transient voltage surge suppression, surge current diversion and high frequency noise attenuation in all electrical modes for equipment connected downstream from the facility's meter or load side of the main overcurrent device. The unit shall be connected in parallel with the facility's wiring system.

#### 1.2 RELATED DOCUMENTS AND APPLICABLE STANDARDS

Systems shall be designed, manufactured, tested, and installed in accordance with the following applicable documents and standards:

1. Underwriters Laboratories (UL1449 Latest Addition and UL 1283)
2. ANSI/IEEE (C62.41 and C62.45)
3. Military Standards (MIL – STD 220A)
4. National Electric Code (NEC)
5. Underwriter's Laboratories 248

### PART 2 - PRODUCTS

#### 2.1 APPROVED MANUFACTURER

The equipment manufacturer shall be the approved manufacturer for internally mounted devices.

Approved manufacturers for external devices:

Current Technologies  
Power & Systems Innovations  
PO Box 590223  
Orlando, FL 32859-0223

Surge Suppression Inc  
Surge Suppression Incorporated  
P.O. Box 674  
Destin, FL 32540-0674

## 2.2 DEVICES

Surge Protection Devices (SPD's) shall be UL listed at or above the available fault current level at the point of SPD application by UL, Per UL 1449 latest edition.

The SPD shall be a parallel design using fast-acting energy protection that will divert and dissipate the surge energy.

Units shall have:

1. Minimum 10 mode operation for all 3 phase Y and high leg Delta configurations and six modes of protection for all 3 phase Delta "no Neutral" configurations.
2. One nanosecond or less response time for any individual component, and shall be self-restoring and fully automatic.
3. Extended noise filtration with a 10 kHz to 100 MHz range.
4. LED indication of unit failure to indicate the continuous positive operational status of each protected phase.
5. System Voltage shall be as indicated on the drawings.
6. The fusing system shall be capable of allowing the rated maximum single impulse surge current to pass through without fuse operation.
7. SPD's shall be installed with leads as short as possible (not to exceed 24 inches). SPD's may be mounted internally in Motor Control Centers, switchgear and switchboards. SPD's shall be mounted externally at panelboards and control panels.
8. All SPD panel units shall be guaranteed by the installing CONTRACTOR and surge suppression manufacturer to be free of defects in materials and workmanship for a period of not less than 10 years from the date of substantial completion of the system to which the suppressor is installed.
9. For each SPD type or size used on this project provide the following submittal data:
  - a. Complete schematic data for suppressor, indicating part numbers, dimensional drawings and mounting arrangement.
  - b. Cut sheets which include Peak Surge Current "per mode", Let Through Current, UL tested voltage protection rating (VPR) and maximum Continuous Operating Voltage (MCOV).
  - c. Copy of Warranty Statement

## 2.3 APPLICATIONS

Surge Current ratings shall be as noted on the drawings.

## 2.4 FILTERING

The system shall provide a UL 1283 Listed Electromagnetic Interference Filter capable of attenuating noise levels produced by electromagnetic interference and radio frequency

interference.

## 2.5 FUSING

Fuse component(s) identification and surge rating. The manufacture shall provide documentation demonstrating the tested surge current rating (8x20µsec) of the fuse. The surge rating of the fuse shall be greater than the combined surge current rating of all downstream connected suppression elements.

Fusing: Suppression component(s) identification and surge rating. The manufacturer shall provide documentation identifying the suppression element(s) connected in series with fuse element(s) and provide the suppression elements published 8x20µsec surge current rating. The rating of the suppression element(s) shall be less than the rating of upstream fusing element(s).

Fusing: Surge performance. All fusing shall be required to meet the single pulse surge current testing requirements of Section 2.2 above.

Fusing: Isolation. The unit shall have each MOV fused and designed to operate only in the event of an MOV failure within the SPD device.

Fusing Coordination: Units that can't demonstrate MOV-fuse coordination above are not acceptable.

Fusing: UL Rating. All fusing shall be 200kAIC UL248 Recognized.

## 2.6 IN-FIELD TESTING

The unit shall be equipped with a performance data extraction protocol allowing unit performance data, including percent of protection remaining, to be transmitted to an internal, external status analyzer.

## 2.7 ENCLOSURE.

Outside - Units shall be provided in a NEMA type 4X enclosures.

# **PART 3 – EXECUTION**

## 3.1 SYSTEM TESTING

Upon completion of installation, a factory-authorized local service representative shall provide product startup testing services. The tests shall include:

1. On-line Testing: Verification that all suppression and filtering paths are operating with 100% protection as well as verification of proper facility neutral-to-ground bond by measuring neutral-to-ground current and voltage.

2. Off-line Testing: Impulse injection to verify the system tolerances as well as verification of proper facility neutral-to-ground bond. To be compared to factory benchmark test parameters supplied with each individual unit.

### 3.2 DOCUMENTATION AND REPORTING

A copy of the startup test results and the factory benchmark testing results shall be supplied to the ENGINEER and the OWNER for confirmation of proper system function. This letter shall also clarify that the integrity of all neutral-to-ground bonds were verified through testing and visual inspection, and that all grounding bonds were observed to be in place.

### 3.3 SYSTEM WARRANTY

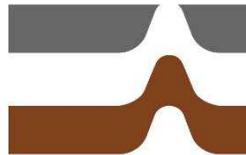
The SPD system manufacturer shall warranty the entire system against defective materials and workmanship for a period of ten (10) years following substantial completion.

END OF SECTION 16670

# **SECTION 8 - REPORTS**

## **Geotech Report**

**Subsurface Exploration and  
Geotechnical Engineering Evaluation  
Cottondale Police Station,  
2659 Front Street,  
Cottondale, Florida**



**Ardaman & Associates, Inc.**

### **CORPORATE HEADQUARTERS**

8008 S. Orange Avenue, Orlando, Florida 32809 - Phone: (407) 855-3860 Fax: (407) 859-8121

### **Branch Office Locations**

Florida: Bartow, Cocoa, Fort Myers, Miami, Orlando, Port St. Lucie, Sarasota, Tallahassee, Tampa, West Palm Beach

Louisiana: Baton Rouge, New Orleans, Shreveport

Texas: Houston

### **MEMBERS:**

ASTM International  
Society of American Military Engineers  
American Council of Engineering Companies



**Ardaman & Associates, Inc.**

Geotechnical, Environmental and  
Materials Consultants

May 15, 2025

Ardaman File No. 113-25-40-1144

David Melvin Engineers  
2451 Barrington Circle, Suite 101  
Tallahassee, Florida 32308  
Email: [kimholloway@melgineng.com](mailto:kimholloway@melgineng.com)

Attention: Ms. Kimberly M. Holloway, P.E.

Subject: Subsurface Exploration and  
Geotechnical Engineering Evaluation  
Cottdale Police Station,  
2659 Front Street,  
Cottdale, Florida

Dear Ms. Holloway:

As requested and authorized, we have completed a subsurface exploration and geotechnical engineering evaluation for the subject project. The purposes of performing this exploration were to evaluate the general subsurface conditions within the building area, and to provide recommendations for site preparation and foundation support. This report documents our findings and presents our engineering recommendations.

### **SITE LOCATION AND SITE DESCRIPTION**

The site for the proposed police station is located at 2659 Front Street, Cottdale, Florida (Section 15, Township 01 North, Range 01 West). The new police station is planned between the existing town hall and Fire Station. The general site location is shown on Figure 1.

### **PROPOSED CONSTRUCTION AND GRADING**

It is our understanding that the proposed development includes a one-story structure approximately 46 feet by 56 feet in "footprint" plan dimensions with a finished floor elevation (FFE) of 136.8 feet. The building will have a hurricane safe room and will be constructed out of 12 inch CMU load bearing walls.

For the purposes of our analysis, we have assumed the maximum loading conditions for the structure to be on the order of 4 kips per linear foot for wall foundations, 50 kips for individual column foundations, and 100 pounds per square foot (psf) for slab-on-grade floors.

3175 West Tharpe Street, Tallahassee, Florida 32303 Phone: (850) 576-6131

Florida: Bartow, Cocoa, Fort Myers, Miami, Orlando, Port St. Lucie, Sarasota, Tallahassee, Tampa, West Palm Beach

Louisiana: Baton Rouge, New Orleans, Shreveport

Texas: Houston

Based on the existing grades and the planned FFE, we estimate that up to about 1 to 2 feet of fill is required to raise the building are to final elevations. If actual building loads or fill height exceed our assumptions, then the recommendations in this report may not be valid.

### **REVIEW OF SOIL SURVEY MAPS**

Based on information obtained online from the Web Soil Survey as operated by the U.S. Department of Agriculture Natural Resources Conservation Services, the site is located in an area mapped as the “Fuquay coarse sand, 0 to 5 percent slopes” soil series.

The “Fuquay coarse sand, 0 to 5 percent slopes” soil series consists of loamy marine deposits. The internal drainage of the “Fuquay coarse sand, 0 to 5 percent slopes” is well drained and the soil permeability is moderately low to moderately high. According to the Soil Survey, the seasonal high water table is typically within 30 to 48 inches of the natural ground surface.

### **FIELD EXPLORATION PROGRAM**

#### **SPT Borings**

The field exploration program included performing four (4) Standard Penetration Test (SPT) borings advanced to 20 feet below the existing ground surface generally using the methodology outlined in ASTM D-1586. A summary of this field procedure is included in the Appendix.

The borings were sampled at 18-inch intervals to 10 feet deep and at 5-foot intervals thereafter. Soil samples recovered during performance of the borings were visually classified in the field and representative portions of the samples were transported to our laboratory in sealed sample jars.

The groundwater level at each of the boring locations was measured during drilling. The borings were backfilled with soil cuttings upon completion.

#### **Test Locations**

The approximate locations of the borings are schematically illustrated on a site plan shown on Figure 1. These locations were determined in the field by estimating distances from existing site features and should be considered accurate only to the degree implied by the method of measurement used.

### **LABORATORY PROGRAM**

Representative soil samples obtained during our field sampling operation were packaged and transferred to our laboratory for further visual examination and classification. The soil samples were classified using visual-manual procedures in general accordance with the Unified Soil Classification System (ASTM D-2488). The resulting soil descriptions are shown on the soil boring profiles presented on Figure 2.

In addition, we conducted natural moisture content tests (ASTM D2216), percent fines analyses (ASTM D1140), and Atterberg limits tests (ASTM D4318) on selected soil samples obtained from the borings. The results of these tests are presented adjacent to the sample depth on the boring profiles on Figure 2.

## GENERAL SUBSURFACE CONDITIONS

### General Soil Profile

The results of the field exploration and laboratory programs are graphically summarized on the soil boring profiles presented on Figure 2. The stratification of the boring profiles represents our interpretation of the field boring logs and the results of laboratory examinations of the recovered samples. The stratification lines represent the approximate boundary between soil types. The actual transitions may be more gradual than implied.

The results of the borings indicate the following general soil profile:

Depth Below Ground Surface (feet)		Description
From	To	
0	3	Medium to fine sand with silt to silty medium to fine sand (SP-SM to SM)
3	5	Silty, clayey medium to fine sand (SM to SC)
5	8	Very clayey medium to fine sand (SC) & sandy lean to fat clay (CL to CH)
8	20	Clayey medium to fine sand with seams of clay (SC) & very clayey medium to fine sand (SC)

The above soil profile is outlined in general terms only. Please refer to Figure 2 for soil profile details.

We note that the thickness of asphaltic concrete and base shown on the boring profiles should be considered rough approximations only. Coring of the pavement section would be required to provide accurate thickness measurements.

### Groundwater Level

The groundwater level was measured in the boreholes during drilling. As shown on Figure 2, groundwater was not encountered on the dates indicated. However, this does not necessarily mean that groundwater would not be encountered within the vertical reach of the borings at some other time. Fluctuations in groundwater levels should be anticipated throughout the year primarily

due to seasonal variations in rainfall and other factors that may vary from the time the borings were conducted. We note that groundwater may also “perch” (be held high) over clayey, low permeability soils within more permeable sandy soils during wet weather periods.

### **NORMAL SEASONAL HIGH GROUNDWATER LEVEL**

The groundwater level is affected by a number of factors. The amount of rainfall and the drainage characteristics of the soils, the land surface elevation, relief points such as drainage ditches, lakes, rivers, swamp areas, etc., and distance to relief points are some of the more important factors influencing the groundwater level.

The normal seasonal high groundwater level each year is the level in the August-September period at the end of the rainy season during a year of normal (average) rainfall. The water table elevations associated with a higher than normal rainfall and in the extreme case, flood, would be higher to much higher than the normal seasonal high groundwater level, and could occur at times outside of the August-September period. The normal high water levels would more approximate the normal seasonal high groundwater levels.

Based on our interpretation of the site conditions using our boring logs, we estimate the normal seasonal high groundwater level at the boring locations to be approximately 5 feet below existing grade. We anticipate that this will be a perched groundwater table, perching within the sandy soils on top of the more clayey soils typically encountered at a depth of around 5 feet.

### **ENGINEERING EVALUATION AND RECOMMENDATIONS**

#### **General**

Based upon subsurface conditions encountered at the site, and the assumed structural loads, it is our opinion that a shallow foundation system is suitable for support of the proposed structures, provided that accommodations to the potential volume change from underlying moderately to highly plastic clay are provided.

The borings encountered moderately to highly plastic soils with a potential for volume change with variations in moisture content. Fluctuations in volume of these clays commonly cause differential movement (settlement & heave) of shallow foundations, which can affect the superstructure and cause cracks. Stiffening of the foundation, slab, and structure is a locally accepted technique to mitigate the effects of differential movement of the foundations. These recommendations are elaborated in the “Foundation Support” section below.

The following are our recommendations for overall site preparation and foundation support for the proposed facility based on the existing soil conditions encountered during the exploration. The recommendations are made as a guide for the design engineer and/or architect, parts of which should be incorporated into the project's specifications.

## **Stripping and Grubbing/Root-Raking**

The "footprints" of the proposed buildings and other hardscape areas, plus a minimum margin of five feet, should be stripped of all surface vegetation, stumps, debris, organic topsoil or other deleterious materials, as encountered. Buried utilities and other underground structures should be removed or plugged to eliminate conduits into which surrounding soils could erode.

After stripping, the site should be grubbed/root-raked such that roots with a diameter greater than ½ inch, stumps, or small roots in a dense state, are completely removed. The actual depth(s) of stripping and grubbing/root-raking must be determined by visual observation and judgment during the earthwork operation. Grubbing/root-raking should continue until determined to be adequate by Ardaman's representative who is monitoring the root-raking.

All existing foundations, slabs, asphalt, and any other underground structures should be removed from the proposed construction area. If pipes or any collapsible or leak prone utilities are not removed or completely filled (with grout or concrete), they might serve as conduits for subsurface erosion resulting in excessive settlements. Over-excavated areas resulting from the removal of underground structures and unsuitable materials should be backfilled in accordance with the fill soils section of this report. This excavation must not undermine the existing building foundations. Provide shoring, bracing, and/or underpinning of existing footings as necessary to protect from failure.

It has been our experience that soils surrounding existing buildings sometimes contain pockets of construction debris or other deleterious materials requiring removal and replacement with compacted clean fine sands. Therefore, we recommend that the stripped surface be inspected by Ardaman & Associates, Inc.

## **Proof-rolling**

We recommend proof-rolling the cleared surface to locate any unforeseen soft areas or unsuitable surface or near-surface soils, to increase the density of the upper soils, and to prepare the existing surface for the addition of the fill soils (as required). Proof-rolling of the building areas should consist of multiple passes of a compactor capable of achieving the density requirements described in the next paragraph. Each pass should overlap the preceding pass by 30 percent to achieve complete coverage. If deemed necessary, in areas that continue to "yield", remove all deleterious material and replace with clean, compacted sand backfill. The proof-rolling should occur after cutting and before filling. Proof-rolling should be monitored in the field by an Ardaman representative.

A density equivalent to or greater than 95 percent of the modified Proctor (ASTM D-1557) maximum dry density value for a depth of 2 feet in the building areas must be achieved beneath the stripped and grubbed ground surface. Additional passes and/or over-excavation and re-compaction may be required if these minimum density requirements are not achieved. The soil moisture should be adjusted as necessary during compaction.

Care should be exercised to avoid damaging any neighboring structures or other facilities while the compaction operation is underway. Compaction should cease if deemed detrimental to adjacent structures or utilities, and Ardaman & Associates should be notified immediately. Heavy vibratory compaction should not be used where it could affect existing structures.

### **Suitable Fill Material and Compaction of Fill Soils**

All fill materials should be free of organic materials, such as roots and vegetation. We recommend using fill with less than 12 percent by dry weight of material passing the U.S. Standard No. 200 sieve size. Soils with more than 12 percent passing the No. 200 sieve can be used in some applications, but will be more difficult to compact due to their inherent nature to retain soil moisture. We do not recommend using fill soils with percent passing the No. 200 sieve in excess of 35 percent, or with a liquid limit in excess of 40 and plastic index in excess of 10. Surficial sands in the top 3 feet of the borings generally meet these criteria.

All structural fill should be placed in level lifts not to exceed 12 inches in uncompacted thickness. Each lift should be compacted to at least 95 percent of the modified Proctor (ASTM D-1557) maximum dry density value. The filling and compaction operations should continue in lifts until the desired elevation(s) is achieved. If hand-held compaction equipment is used, the lift thickness should be reduced to no more than 6 inches.

### **Foundation Support by Spread Footings and Foundation Compaction Criteria**

After the mass earthwork discussed in the previous report sections is complete, excavate the foundations to the proposed bottom of footing elevations. If Stratum 3B is encountered within the foundation/slab excavations, these soils should be over-excavated to 2 feet below the bottom of footings and slabs. Based on the depth Stratum 3B was encountered in the borings, we do not anticipate that this overexcavation will be required. These over-excavations should be backfilled in accordance with the recommendations provided in the fill section above. Verify the in-place compaction for a depth of 2 feet below the footing bottoms. If necessary, compact the soil at the bottom of the excavations to at least 95 percent of the modified Proctor maximum dry density for a depth of 2 feet below the footing bottoms.

We recommend stiffening the foundation (conventional stiffening with added reinforcement or post tensioning) to mitigate the effects of differential movement of the foundations. Stiffening typically consists of increasing the percentage of steel reinforcement within the strip footings by adding a layer of steel reinforcement to address negative moments. The slabs should be stiffened as well by providing two layers of welded wire mesh. Post-tensioning may also be used in lieu of typical reinforcement. Details of the foundation stiffening should be determined by the structural engineer. We estimate differential settlement on the order of 1-inch in 40 feet.

The soil volume change can be mitigated by maintaining favorable site conditions that provide relatively stable soil moisture. Conditions that induce moisture variations in soil, such as

vegetation, irrigation, or poor site drainage, could induce greater variations in volume change. Therefore, we recommend keeping vegetations that have an extensive root system and a relatively high demand for water such as trees and to some extent shrubs away from the building as much as practical and providing positive drainage away from the building.

Based on the existing soil conditions, and assuming the above outlined proof-rolling, fill evaluation, and compaction criteria are implemented, an allowable soil bearing pressure of 2,000 pounds per square foot (psf) may be used in the foundation design. The provided bearing pressures should result in foundation settlement within tolerable limits (i.e., maximum total settlement of 1-inch). Note that this foundation settlement is in addition to the differential movement provided above due to the clayey soils volumetric change with varying moisture content.

All bearing wall foundations should be a minimum of 18 inches wide and column foundations 24 inches wide. A minimum soil cover of 18 inches should be maintained from the bottom of the foundations to the adjacent finished grades.

### **Floor Slab Moisture Reducer and Slab Compaction Requirements**

Prior to concrete placement, soil compaction beneath floor slabs should be verified for a depth of 12 inches and meet the 95 percent criteria (modified Proctor, ASTM D-1557). Based on the existing soil conditions, and assuming the above outlined proof-rolling and compaction criteria are implemented an allowable subgrade modulus of 125 pci may be used in the slab design.

Precautions should be taken during the slab construction to reduce moisture entry from the underlying subgrade soils. Moisture entry can be reduced by installing a membrane between the subgrade soils and floor slab. Care should be exercised when placing the reinforcing steel (or mesh) and slab concrete such that the membrane is not punctured. We note that the membrane alone does not prevent moisture from occurring beneath or on top of the slab.

If interior columns are isolated from the floor slab, an expansion joint should be provided around the columns and sealed with a water-proof sealant.

### **QUALITY ASSURANCE**

We recommend establishing a comprehensive quality assurance program to verify that all site preparation and foundation and pavement construction is conducted in accordance with the appropriate plans and specifications. Materials testing and inspection services should be provided by Ardaman & Associates.

As a minimum, an on-site engineering technician should monitor all stripping and grubbing to verify that deleterious materials have been removed and should observe the proof-rolling operation to verify that the appropriate number of passes are applied to the subgrade. In-situ density tests should be conducted during earthwork activities and below all structural areas

including footings and floor slabs to verify that the required densities have been achieved. In-situ density values should be compared to laboratory Proctor moisture-density results for each of the different natural and fill soils encountered.

Finally, we recommend inspecting and testing the construction materials for the foundations and other structural components.

### **IN-PLACE DENSITY TESTING FREQUENCY**

Earthwork testing is typically performed on an on-call basis when the contractor has completed a portion of the work. The test result from a specific location is only representative of a larger area if the contractor has used consistent means and methods and the soils are practically uniform throughout. The frequency of testing can be increased and full-time construction inspection can be provided to account for variations. We recommend that the following minimum testing frequencies be utilized.

In proposed building areas, a minimum frequency of one in-place density test for each 1,000 square feet of area should be used. In-place density testing should be performed at this minimum frequency for a depth of 2 feet below natural ground and for every 1-foot lift of fill placed in the structural area. In addition, density tests should be performed in each column footing for a depth of 2 feet below the bearing surface. For continuous or wall footings, density tests should be performed at a minimum frequency of one test for every 50 linear feet of footing, and for a depth of 2 feet below the bearing surface.

Representative samples of the various natural ground and fill soils should be obtained and transported to our laboratory for Proctor compaction tests. These tests will determine the maximum dry density and optimum moisture content for the materials tested and will be used in conjunction with the results of the in-place density tests to determine the degree of compaction achieved.

### **CLOSURE**

The analyses and recommendations submitted herein are based on the data obtained from the soil borings presented on Figure 2 and the assumed loading conditions. This report does not reflect any variations which may occur adjacent to or between the borings. The nature and extent of the variations between the borings may not become evident until during construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations presented in this report after performing on-site observations during the construction period and noting the characteristics of the variations.

In the event any changes occur in the design, nature, or location of the proposed facility, we should review the applicability of conclusions and recommendations in this report.

Because of Ardaman & Associates' familiarity with this site and the proposed development gained through performing the subsurface soil exploration and geotechnical engineering evaluation as presented in this report, Ardaman & Associates is best suited to provide monitoring and testing services during earthwork, and to provide continued evaluation and guidance during construction should variations in the soil conditions be encountered.

This study is based on a relatively shallow exploration and is not intended to be an evaluation for sinkhole potential. This study does not include an evaluation of the environmental (ecological or hazardous/toxic material related) condition of the site and subsurface.

This report has been prepared for the exclusive use of David H. Melvin in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made.

We are pleased to be of assistance to you on this phase of the project. When we may be of further service to you or should you have any questions, please contact us.

Very truly yours,  
ARDAMAN & ASSOCIATES, INC.  
Florida Registry 5950

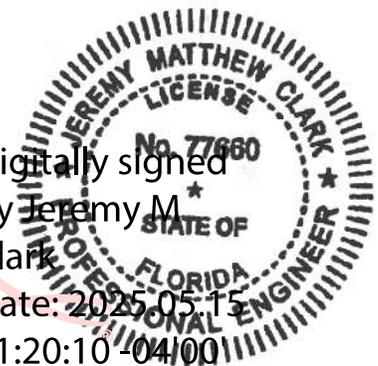


Aayush R. Tiwary, P.E.  
Project Engineer  
Florida License 101118

ART/JMC

Jeremy  
M Clark

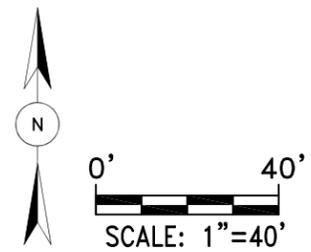
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by Jeremy M  
Clark  
Date: 2025.05.15  
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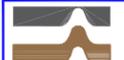


Jeremy M. Clark, P.E.  
Senior Engineer  
Florida License 77660

This item has been digitally signed and sealed by Jeremy M. Clark, P.E. on the date adjacent to the seal.  
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

TEST BORING LOCATION PLAN  
(Image Source: Google Earth Pro)

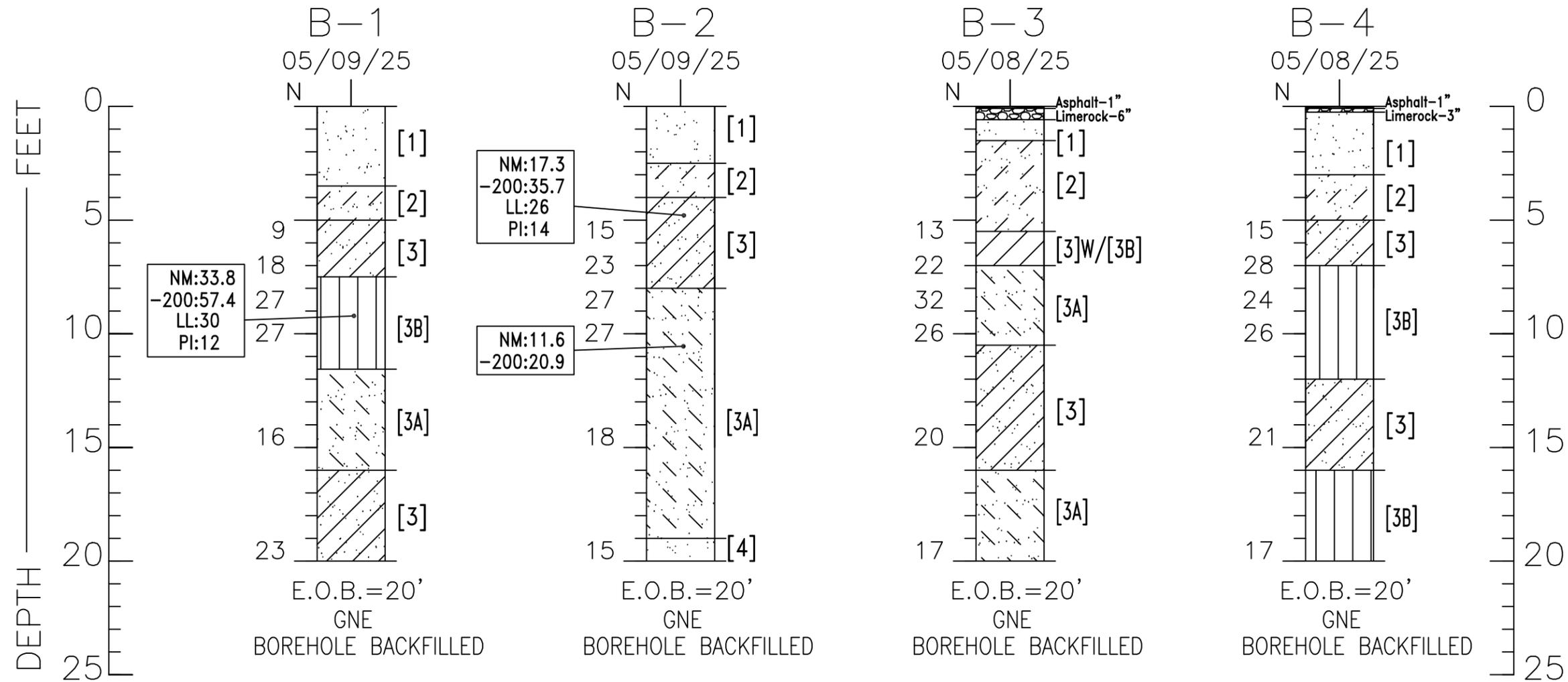


 Ardaman & Associates, Inc.  
3175 W. Tharpe Street  
Tallahassee, Florida 32303  
(850) 576-6131

SHEET TITLE:  
TEST BORING LOCATION MAP  
COTTONDALE POLICE STATION  
COTTONDALE, JACKSON COUNTY, FLORIDA

DRAWN BY: ART	CHECKED BY: JMC	DATE: 5/13/25
FILE NO: 113-25-40-1144	APPROVED BY: J.M. CLARK P.E.	FIGURE 1

# SOIL BORING PROFILES



## SOIL LEGEND

- [1] BROWN MEDIUM TO FINE SAND W/SILT TO SILTY MEDIUM TO FINE SAND (SP-SM TO SM; A-3 TO A-2-4)
- [2] TAN TO BROWN SILTY, CLAYEY MEDIUM TO FINE SAND (SM TO SC; A-2-4 TO A-2-6)
- [3] ORANGISH BROWN & TAN VERY CLAYEY MEDIUM TO FINE SAND (SC; A-6)
- [3A] ORANGISH BROWN & TAN CLAYEY MEDIUM TO FINE SAND WITH SEAMS OF CLAY (SC; A-2-6)
- [3B] TAN & GRAY SANDY LEAN TO FAT CLAY (CL TO CH; A-6 TO A-7)
- [4] YELLOWISH BROWN MEDIUM TO FINE SAND W/SILT TO SILTY MEDIUM TO FINE SAND (SP-SM TO SM; A-3 TO A-2-4)

WHILE THE BORINGS ARE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THEIR RESPECTIVE LOCATIONS AND FOR THEIR RESPECTIVE VERTICAL REACHES, LOCAL VARIATIONS CHARACTERISTIC OF THE SUBSURFACE MATERIALS OF THE REGION ARE ANTICIPATED AND MAY BE ENCOUNTERED. THE BORING LOGS AND RELATED INFORMATION ARE BASED ON THE DRILLER'S LOGS AND VISUAL EXAMINATION OF SELECTED SAMPLES IN THE LABORATORY. THE DELINEATION BETWEEN SOIL TYPES SHOWN ON THE LOGS IS APPROXIMATE AND THE DESCRIPTION REPRESENTS OUR INTERPRETATION OF SUBSURFACE CONDITIONS AT THE DESIGNATED BORING LOCATIONS ON THE PARTICULAR DATE DRILLED.

GROUNDWATER ELEVATIONS SHOWN ON THE BORING LOGS REPRESENT GROUNDWATER SURFACES ENCOUNTERED ON THE DATES SHOWN. FLUCTUATIONS IN WATER TABLE LEVELS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR. ABSENCE OF WATER SURFACE DATA ON CERTAIN BORINGS IMPLIES THAT NO GROUNDWATER DATA IS AVAILABLE, BUT DOES NOT NECESSARILY MEAN THAT GROUNDWATER WILL NOT BE ENCOUNTERED AT THESE LOCATIONS OR WITHIN THE VERTICAL REACHES OF THESE BORINGS IN THE FUTURE.

### ENGINEERING CLASSIFICATION

I COHESIONLESS SOILS		
DESCRIPTION	BLOW COUNT "N"	
VERY LOOSE	0 TO 4	
LOOSE	4 TO 10	
MEDIUM	10 TO 30	
DENSE	30 TO 50	
VERY DENSE	>50	
II COHESIVE SOILS		
DESCRIPTION	UNCONFINED COMPRESSIVE STRENGTH, QU, TSF	BLOW COUNT "N"
VERY SOFT	<1/4	0 TO 2
SOFT	1/4 TO 1/2	2 TO 4
MEDIUM	1/2 TO 1	4 TO 8
STIFF	1 TO 2	8 TO 15
VERY STIFF	2 TO 4	15 TO 30
HARD	>4	>30

## LEGEND

- ⊙ B APPROXIMATE TEST BORING LOCATION
- N STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT (ASTM D-1586)
- EOB END OF BORING
- GNE GROUNDWATER NOT ENCOUNTERED
- NM NATURAL MOISTURE CONTENT IN PERCENT (ASTM D-2216)
- 200 PERCENT PASSING NO. 200 SIEVE SIZE (PERCENT FINES)(ASTM D-1140)
- LL LIQUID LIMIT (ASTM D-4318)
- PI PLASTICITY INDEX (ASTM D-4318)
- SP-SM,SM,SC UNIFIED SOIL CLASSIFICATION SYSTEM
- A-3,A-2-4 AASHTO SOIL CLASSIFICATION SYSTEM
- DRILLERS: SH, DK, JK
- DRILL RIG: CME 55, AUTO-HAMMER

**Ardaman & Associates, Inc.**  
 3175 W. Tharpe Street  
 Tallahassee, Florida 32303  
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SHEET TITLE:  
 SUBSURFACE SOIL EXPLORATION FOR  
 COTTONDALE POLICE STATION  
 COTTONDALE, JACKSON COUNTY, FLORIDA

DRAWN BY: ART      CHECKED BY: JMC      DATE: 5/13/25  
 FILE NO. 113-25-40-1144      APPROVED BY: J.M. CLARK, P.E.      FIGURE 2

## **APPENDIX**

### Standard Penetration Test Procedures

## **STANDARD PENETRATION TEST**

The standard penetration test is a widely accepted test method of *in situ* testing of soils (ASTM D 1586), and Ardaman & Associates generally follows this test method. A 2-foot long, 2-inch O.D. split-barrel sampler attached to the end of a string of drilling rods is driven 18 or 24 inches into the ground by successive blows of a 140-pound hammer freely dropping 30 inches. The number of blows needed for each 6 inches of penetration is recorded. The sum of the blows required for penetration of the second and third 6-inch increments of penetration constitutes the test result or N-value. After the test, the sampler is extracted from the ground and opened to allow visual examination and classification of the retained soil sample. The N-value has been empirically correlated with various soil properties.

The tests are usually performed at 5-foot intervals. The test holes are advanced to the test elevations by rotary drilling with a cutting bit, using circulating fluid to remove the cuttings and hold the fine grains in suspension. The circulating fluid, which is a bentonitic drilling mud, is also used to keep the hole open below the water table by maintaining an excess hydrostatic pressure inside the hole. In some soil deposits, particularly highly pervious ones, flush-coupled casing must be driven to just above the testing depth to keep the hole open and/or prevent the loss of circulating fluid.

Representative split-spoon samples from the soils are brought to our laboratory in air-tight jars for further evaluation and testing, if necessary.