

# Town of Cairo

PO Box 728  
512 Main Street  
Cairo, NY 12413

## Town of Cairo Ambulance Project

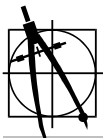
KA Project #: 80217.21

Phase III – Building Construction

## Project Manual & Specifications

March 3, 2020

Prepared By:



**Kaaterskill Associates**

*Surveyors, Architects and Engineers*

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## SECTION 00 01 50 – LIST OF DRAWINGS

### PART 1: GENERAL

SECTION INCLUDES – List of Contract Drawings for the renovations to Cairo Ambulance Garage Project.

#### Contract Drawings

#### Architectural

- A-0.0 Title Sheet
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- SK-1 Site Plan

**END OF SECTION 00 01 50**

## SECTION 00 20 00 – INSTRUCTIONS TO BIDDERS

### Part 1: Summary

#### 1.1. Related Documents.

- A. Document 00410 - Bid Form.

### Part 2: Invitation

#### 2.1. Bid Submission

- A. Bids signed and under seal, executed, and dated will be received on or before \_\_\_\_\_, 2020 before 12:00 PM at the office of:
  - 1. Owner's Representative:  
Kayla L. Warner, Clerk  
Town of Cairo  
512 Main Street  
Cairo, N.Y. 12413  
(518) 622-3120 x101  
townclerk@townofcairo.com
- B. An on-site meeting prior to bid submission is scheduled for \_\_\_\_\_, 20\_\_ at 1:00 PM.

#### 2.2. Intent

- A. The intent of this Bid request is to obtain an offer to perform work to Town Facilities located at 25 Railroad Avenue in The Town of Cairo for a Stipulated Sum contract, in accordance with the Contract Documents.
- B. The CONTRACTOR will be responsible for all materials and work depicted in the Contract Documents and as required to complete the project.
- C. The CONTRACTOR will be responsible for compensating for the labor of all on-site staff, technicians, trades people the current prevailing wage for Greene County in accordance with NYS DOL during the execution of this project.

#### 2.3. Work Identified in the Contract Documents

- A. Work of this proposed Contract involves the construction and renovation of the Future Cairo Ambulance Facility as depicted in the contract documents.
- B. This is a Prevailing Wage project.
- C. Bid bond/security of 5% is required for this project.
- D. Performance bond equal to amount of the awarded bid is required for this project.
- E. Payment bond equal to amount of the awarded bid is required for this project.

### Part 3: BID DOCUMENTS AND CONTRACT DOCUMENTS

#### 3.1. DEFINITIONS

- A. Bid Documents: Contract Documents supplemented with Invitation to Bid, Instructions to Bidders, Information available to Bidders, Bid Form Supplements to Bid Forms and Appendices and Bid securities identified.
- B. Bid, Offer, or Bidding: Act of submitting an offer under seal.

- C. Bid Amount: Monetary sum identified by the Bidder in the Bid Form.
- D. NYSDOL: New York State Department of Labor.

### **3.2. CONTRACT DOCUMENTS IDENTIFICATION**

- A. The Contract Documents are identified as CONTRACT Number 80217.17, as prepared by Architect/Engineers.

### **3.4. EXAMINATION**

- A. Upon receipt of Bid Documents verify that documents are complete. Notify Architect/Engineers should the documents be incomplete.
- B. Immediately notify Architect/Engineers upon finding discrepancies or omissions in the Bid Documents.

### **3.5. INQUIRIES/ADDENDA**

- A. Direct all questions in writing to Brandan Bachor, Kaaterskill Associates, ([b.bachor@keaeng.com](mailto:b.bachor@keaeng.com)), 518-622-9667 x210.
- B. Addenda may be issued during the bidding period. All Addenda become part of the Contract Documents. Include resultant costs in the Bid Amount.
- C. Verbal answers are not binding on any party.
- D. Clarifications requested by bidders must be in writing. The reply will be in the form of an Addendum, a copy of which will be forwarded to known recipients.

## **Part 4: BID SUBMISSION**

### **4.1. SUBMISSION PROCEDURE**

- A. Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed.
- B. Submit one copy of the executed offer on the Bid Forms provided, Supplement A Cost Breakdown, signed and sealed with the required bid bond/security and non-collusive certification in a closed opaque envelope, clearly identified with bidder's name, project name and Owner's name on the outside.
- C. Double Envelope: Insert the closed and sealed Bid Form envelope plus requested security deposit, in a large opaque envelope and label this envelope as noted above.
- D. Improperly completed information, irregularities in security deposit, lack of non-collusive certification may be cause not to open the Bid Form envelope and declare the bid invalid or informal.
- E. An abstract summary of submitted bids will be made available to all bidders following bid opening.

## Part 5: BID ENCLOSURES/REQUIREMENTS

### 5.1. INSURANCE REQUIREMENTS

- A. The Town of Cairo's policy is that all suppliers doing business with the Town carry insurance. This includes both suppliers that provide services and suppliers that provide goods. The standard insurance requirements for suppliers, including types of insurance coverage and the amount of insurance coverage suppliers need to carry is to be in accordance with the Town's Schedule "B" – Standard Insurance Provisions (Contractor).

Schedule "B"  
Standard Insurance Provisions  
(Contractor)

1. The Contractor agrees to procure and maintain liability insurance without additional expense to the Town, until expiration of the applicable statute of limitations for claims (for contract, negligence or otherwise) against the Town and the Contractor arising out of the Contractor's performance of the Agreement. Prior to commencing work, the Contractor shall furnish to the Town a binder or policy declarations page from the insurance company(ies), showing that these requirements are met. Such binder shall provide (1) that the policy shall not be changed or canceled until thirty (30) days prior written notice has been given to the Town; and (2) that Town of Cairo, N.Y. is named as an additional insured.
2. Town of Cairo, N.Y. must be named as an additional insured. The description of operations, statement must say "Town of Cairo, N.Y. is an additional insured per endorsement #xxxx, a copy of which is attached."
3. If at any time any of the policies required herein shall be or become unsatisfactory to the Town, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Town, the Contractor shall upon notice to that effect from the Town, promptly obtain a new policy, submit the same to the Town of Cairo for approval and submit a certificate thereof. Upon failure of the Contractor to furnish, deliver and maintain such insurance, the Agreement, at the election of the Town, may be declared suspended, discontinued or terminated. Failure of the Contractor to take out, maintain, or the taking out or maintenance of any required insurance, shall not relieve the Contractor from any liability under the Agreement, nor shall the insurance requirements be construed to conflict with or otherwise limit the contractual obligations of the Contractor concerning indemnification.
4. In addition to, and not in limitation of the insurance requirements contained herein, the Contractor agrees:
  - (a) that except for the amount, if any, of damage contributed to, caused by or resulting from the negligence of the Town, the Contractor shall indemnify and hold harmless the Town, its officers, employees and agents from and against any and all liability, damage, claims, demands, costs, judgments, fees, attorney's fees or loss arising directly or indirectly out of the negligent acts or omissions hereunder by the Contractor or third parties under the direction or controls of the Contractor; and

- (b) to provide defense for and defend, at its sole expenses, any and all claims, demands or causes of action directly or indirectly arising out of the acts or omissions referred to herein and to bear all other costs and expenses related to thereto.
5. In the event that claims, for which the Town may be liable, in excess of the insured amounts provided herein are filed by reason of any operations under the Agreement, the amount of excess of such claims or any portion thereof, may be withheld from payment due or to become due the Contractor until such time as the Contractor shall furnish such additional security covering such claims in form satisfactory to the Town of Cairo.
  6. The Contractor shall provide proof of the following coverage (if additional coverage is required for a specific agreement, those requirements will be described in the "Special Conditions" of the contract specifications):
    - (a) Workers' Compensation and Employers Liability Insurance. A policy or policies providing protection for employees in the event of job-related injuries. If the employer is self-insured for Workers' Compensation, a certificate from the New York State Workers' Compensation Board shall be provided evidencing that fact.
    - (b) Professional Liability. The Contractor shall provide proof of such insurance with limits of not less than \$1,000,000/\$3,000,000.
    - (c) Automobile Liability Insurance with the limits of not less than \$300,000 for each accident because of bodily injury, sickness or disease, including death at any time, resulting there from, sustained by any person caused by accident, and arising out of the ownership, maintenance, or use of any automobiles and with the limits of \$100,000 for damage because of injury to or destruction of property, including the loss of use thereof, caused by accident and arising out of the ownership, maintenance or use of any automobiles.
    - (d) General Liability. Including comprehensive form, contractual, premises/completed operations and broad form property insurance with limits of not less than:
      - i. Bodily Injury and Property Damage      \$1,000,000
      - ii. Personal Injury                                      \$1,000,000/\$3,000,000
  7. All policies of the Contractor shall be subject to the following conditions:
    - (a) The Contractor's insurance coverage shall be primary insurance as respects the Town of Cairo. Any insurance or self-insurance maintained by the Town of Cairo shall be excess of the Contractor's insurance and shall not contribute with it.
    - (b) The insurance company(ies) issuing the policy or policies shall have no recourse against the Town of Cairo (including its agents and agencies as aforesaid) for payment of any premiums or for assessments under any form of policy.
    - (c) Any and all deductibles in the above described insurance policies shall be assumed by



and be for the account of, and at the sole risk of, the Contractor. All deductibles and self-insured retentions shall be evidenced on the insurance certificate and shall be subject to prior approval of the Town.

## **5.2. BID FORM REQUIREMENTS**

- B. Complete all requested information in the Bid Form, Supplement A Cost Breakdown, and Appendices.

## **5.3. FEES FOR CHANGES IN THE WORK**

- A. Include the fees for overhead and profit on own Work and Work by subcontractors.
- B. Include in the Bid Form, the overhead and profit fees on own Work and Work by subcontractors, applicable for Changes in the Work, whether additions to or deductions from the Work on which the Bid Amount is based.
- C. Include in the Bid Form, the fees proposed for subcontract work for changes (both additions and deductions) in the Work. Contractor shall apply fees as noted, to the subcontractor's gross (net plus fee) costs on additional work.

## **5.4. BID FORM SIGNATURE**

- A. The Bid Form shall be signed by the bidder, as follows:
  - a. Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature. Affix seal.
  - b. Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature. Affix seal to each signature.
  - c. Corporation: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts. Under each signature. Affix the corporate seal. If the bid is signed by officials other than the president and secretary of the company, or the president and secretary/treasurer of the company, a copy of the by-law resolution of their board of directors authorizing them to do so, must also be submitted with the Bid Form in the bid envelope.
  - d. Joint Venture: Each party of the joint venture shall execute the Bid Form under their respective seals in a manner appropriate to such party as described above, similar to the requirements of a Partnership.

## **Part 6: OFFER ACCEPTANCE/REJECTION**

### **6.1. ACCEPTANCE OF OFFER**

- A. Owner reserves the right to accept or reject any or all offers.
- B. After acceptance by Owner, Architect/Engineer, on behalf of Owner, will issue to the successful bidder, a written Bid Acceptance.

**END OF SECTION 00 20 00**

**SECTION 00 30 00 – AVAILABLE INFORMATION**

Part 1: PROPOSED & EXISTING CONDITIONS, REPORTS AND SURVEYS

- A. Refer to Construction Documents including:
  - a. Drawings dated December 23, 2019.
    - i. Refer to Section 00 01 50
  - b. Project Manual & Specifications dated December 23, 2019.

**END OF SECTION 00 30 00**

**SECTION 00 41 00 – BID FORM**

**PART 1: EXISTING REPORTS AND SURVEYS**

- 1.1. To: Town of Cairo, New York.
- 1.2. For: Town of Cairo Ambulance.
- 1.3. Date: \_\_\_\_\_ (Bidder to enter date)
- 1.4. Submitted By: (Bidder to enter name & address)
  - A. Bidder's Full Name \_\_\_\_\_
    - a. Address \_\_\_\_\_
    - b. City, State, ZIP \_\_\_\_\_
- 1.5. Offer
  - A. Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by Kaaterskill Associates, for the above-mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:
  - B. \_\_\_\_\_ dollars (\$ \_\_\_\_\_), in lawful money of the United States of America.
  - C. We have included the required security Bid Bond as required by the Instruction to Bidders.
  - D. We understand that compliance with the Davis-Bacon Act and other Federal Labor Standards is mandatory for this project work and to pay New York State prevailing wage rates applicable to Greene County.
  - E. All applicable federal and State of New York taxes are excluded from the Bid Sum.
- 1.6. ALTERNATES – *See Section 00415 Supplement A Cost Breakdown*
  - A. Alternates are to be listed and described in Section 004150 Supplement A Cost Breakdown. Alternates are to be priced as individual units as shown in Cost Breakdown.
- 1.7. ACCEPTANCE
  - A. This offer shall be open to acceptance and is irrevocable for sixty (60) days from the bid closing date.
  - B. If this bid is accepted by Owner within the time period stated above, we will:
    - a. Execute the Agreement within five days of receipt of Notice of Award.
    - b. Furnish the required bonds within seven days of receipt of Notice of Award.
    - c. Commence work within ten days after written Notice to Proceed of this bid.
  - C. If this bid is accepted within the time stated, and we fail to commence the Work, or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.
  - D. In the event our bid is not accepted within the time stated above, the required security deposit shall be returned to the undersigned in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

1.8 CHANGES TO THE WORK

- A. When the Architect/Engineer establishes that the method of valuation for Changes in the Work will be net cost plus a percentage fee in accordance with General Conditions, our percentage fee will be:
  - a. \_\_\_\_\_ Percent overhead and profit on the net cost of our own Work;
  - b. \_\_\_\_\_ Percent on the cost of work done by any Subcontractor.
- B. On work deleted from the Contract, our credit to Owner shall be Architect-approved net cost plus of the overhead and profit percentage noted above.

1.9 ADDENDA

- A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.
- B. Addendum # \_\_\_\_\_ Dated \_\_\_\_\_
- C. Addendum # \_\_\_\_\_ Dated \_\_\_\_\_
- D. Addendum # \_\_\_\_\_ Dated \_\_\_\_\_
- E. Addendum # \_\_\_\_\_ Dated \_\_\_\_\_

1.10 BID FORM SUPPLEMENTS

- A. The following Supplements are attached to this Bid Form and are considered an integral part of this Bid Form:
  - a. Document 004150 - Supplement A - Cost Breakdown identifies the Bid Sum segmented into portions as requested.
- B. We agree to submit the following Supplements to Bid Forms within 48 hours after submission of this bid for additional bid information:
  - a. Document 004360 - Supplement C - Statement of Qualifications of Bidders: Include the names of company officers, staffing, financial capability, project experience, current project descriptions and prior project references.

1.11 BID FORM SIGNATURE(S)

- A. The Corporate Seal of: \_\_\_\_\_  
(Bidder - print the full name of your firm)  
was hereunto affixed in the presence of:
- B. \_\_\_\_\_  
(Authorized signing officer, Title)
- C. (Seal)
  
- D. \_\_\_\_\_  
(Authorized signing officer, Title)

1.12 If the Bid is a joint venture or partnership, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

**END OF SECTION 00 41 00**

**SECTION 00 41 50 – SUPPLEMENT A – COST BREAKDOWN**

**Part 1: PARTICULARS – BASE BID**

1.1 The following is a Cost Breakdown referenced in the bid submitted by:

- A. (Bidder) \_\_\_\_\_
- B. TO (Owner) Town of Cairo
- C. Dated \_\_\_\_\_ and which is an integral part of the Bid Form.

**PART 2: ITEM DESCRIPTIONS**

**Town of Cairo Ambulance Facility Project**

Classification	Project Description	Cost
01 00 00	General Conditions	
02 26 23	Asbestos Abatement	
02 41 00	Demolition	
03 00 00	Concrete	
05 00 00	Metals	
06 00 00	Woods, Plastics, & Composites	
07 00 00	Thermal & Moisture Protection	
08 00 00	Openings	
09 00 00	Finishes	
10 00 00	Specialties	
22 00 00	Plumbing	
23 00 00	Mechanical	
26 00 00	Electrical	
28 00 00	Electronic Safety & Security	
31 00 00	Earthwork	
32 00 00	Exterior Improvements	
33 00 00	Utilities	
Total		

**PART 3: ACCEPTANCE OF OFFER**

- A. Awarding of Contract will be based on the Base Bid.
- B. The owner reserves the right to reject any and all bids.

**END OF SECTION 00 41 50**

**SECTION 00 43 30 - VERIFIED STATEMENT OF PAYMENT OF PREVAILING WAGES -CONTRACTOR**

PRC \_\_\_\_\_ **Greene COUNTY**  
Date \_\_\_\_\_ To \_\_\_\_\_  
BID or QOUTE # \_\_\_\_\_

1. \_\_\_\_\_ (Name of person making statement), begin the \_\_\_\_\_ (Owner or if Corporation, the title of such officer) of \_\_\_\_\_ (Full name of Corporation) files this Verified Statement pursuant to Section 220-a of the Labor Law.
2. This Verified Statement involves \_\_\_\_\_  
\_\_\_\_\_ (Contract number and brief description of public work project).
3. Except as stated herein, there are not amounts due and owing to or on behalf of workers employed on the project by the Contractor. (Set forth any unpaid wages and supplements, and if necessary, attach additional sheets. If none, so state).
4. The Contractor hereby files every verified statement required to be obtained by the Contractor from the subcontractor and the same are attached hereto.
5. Upon information and belief, except as stated herein, all workers of subcontractor (exclusive of executive or supervisory employees) employed on the project have been paid the prevailing wages and supplements for their services through \_\_\_\_\_, the last day worked on the project by their subcontractor: (Set forth any unpaid wages and supplements, and if necessary, attach additional sheets. If none, so state and utilize clause SA).

NAME

AMOUNT

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- A. The Contractor has no knowledge of amounts owing to or on behalf of any workers.
6. In the event it is determined by the Commissioner of Labor that the wages or supplements or both of any such subcontractors have not been paid or provided pursuant to the appropriate schedule of wages and supplements, then the Contractor acknowledges that it shall be responsible for payment of which wages and supplements pursuant to the provision of Section 223 of the Labor Law.

**END OF SECTION 00 43 30**

## **SECTION 00 43 40 – SUPPLEMENT B – PREVAILING WAGE RATES**

### **PART 1: PARTICULARS**

- 1.1 All personnel performing work on Town-owned or operated facilities will be compensated as per the New York State Department of Labor's Schedule of Prevailing Wage Rates for Greene County for the trades / worker classifications anticipated for this project work.
- 1.2 These wage rates apply to all public works contracting in the State of New York, in accordance with Article 8 (Section 220 - 223) and Article 9 (Section 230 - 239) of the New York State Labor Law.
- 1.3 Failure to pay the requisite prevailing wages or supplements may cause to be withheld from payment due the prime contractor an amount indicated by the Bureau of Public Work as sufficient to satisfy the unpaid wages and supplements, Including Interest and any civil penalty that may be assessed by the Commissioner of Labor.
- 1.4 Contractors are required to post the schedule of prevailing wage rates on the jobsite and provide copies of the schedule to all their contractors. Contractors must obtain affidavits from the subcontractors that schedules have been provided.
- 1.5 Prevailing Wage information is available to the public on the Department of Labor's website or see the web link below:  
<https://applications.labor.ny.gov/wpp/publicViewPWChanges.do?method=showIt>

**END OF SECTION 00 43 40**

**SECTION 004360 – SUPPLEMENT C – STATEMENT OF QUALIFICATIONS OF BIDDERS**

**PART 1: PARTICULARS**

THE LAW REQUIRES THAT CONTRACTS FOR PUBLIC WORK IN THE STATE OF NEW YORK BE AWARDED TO THE LOWEST RESPONSIBLE BIDDER AS WILL PROMOTE THE PUBLIC INTEREST. IN ORDER TO ASSIST THE TOWN IN DETERMINING WHETHER THE APPARENT LOW BIDDER MEETS THIS STANDARD, THE TOWN RESERVES THE RIGHT TO REQUIRE THE APPARENT LOW BIDDER TO SUBMIT THE FOLLOWING:

To furnish to the County of Greene within 2 calendar days from the date of the request, if identified as the apparent low bidder and if requested by the Town of Cairo, a statement containing the following:

- A. A description (including project name, location and Owner) of any competitively bid project on which the bidder submitted the low bid but was not awarded a contract, within the previous five (5) years.
- B. A current detailed financial statement showing assets (including a list of equipment owned by the bidder), liabilities and net worth, net total billings and average backlogs of uncompleted work on outstanding contracts for each of the previous three (3) years.
- C. A list of the officers and principals of the bidder's legal entity, and a list of all subsidiary or affiliated companies in which the bidder's principals have any financial interest.
- D. A list of the number of full time personnel of the bidder and a description of the construction experience of the bidder's principals and supervisory personnel.
- E. A description of any projects which the bidder or his predecessors failed to complete or any litigation in which the bidder has been involved with in the previous three (3) fiscal years, including a list of project names, locations and Owner.
- F. A list and description of all contracts completed by the bidder within the previous three (3) fiscal years.
- G. A list of at least three (3) project references (including project names, locations, Owners, contact persons and telephone numbers) which included work similar in scope, complexity, and construction value as this proposed project.
- H. A list and description of the status of all uncompleted contracts of the bidder.

1.01 The following ATTACHED HERETO is the list of Supplementary Qualifications of Bidders Information as referenced in the BID FORM submitted by:

1.02 (Bidder) \_\_\_\_\_

1.03 TO (Owner) COUNTY OF GREENE.

**END OF SECTION 004360**



**SECTION 00437 - NON-COLLUSIVE CERTIFICATION**

General Municipal Law – Public Contracts, Article 5-A must be in the documents and paperclipped for review.

§103-d. Statement of non-collusion in bids and proposals to political subdivision of the state

Every bid or proposal hereafter made to a political subdivision of the state or any public department, agency or official thereof where competitive bidding is required by statute, rule, regulation or local law, for work or services performed or to be performed or goods sold or to be sold, shall contain the following statement subscribed by the bidder and affirmed by such bidder as true under the penalties of perjury: Non-collusive bidding certification.

“(a) By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

- (1) The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, at to any matter relating to such prices with any other bidder or with any competitor; and
- (2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
- (3) No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.”

\_\_\_\_\_  
BUSINESS NAME (PRINT)

\_\_\_\_\_  
BIDDER (PRINT)

\_\_\_\_\_  
BIDDER (SIGNATURE)

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

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

Date of Proposal: \_\_\_\_\_

**END OF SECTION 00 43 70**

**SECTION 004400 - CHANGE ORDER**

CHANGE ORDER NO. \_\_\_\_\_  
CONTRACT NO. \_\_\_\_\_

DATE: \_\_\_\_\_  
SHEET \_\_\_\_\_ OF \_\_\_\_\_

PROJECT: \_\_\_\_\_

OWNER: \_\_\_\_\_

OWNER'S ADDRESS: \_\_\_\_\_

OWNER'S PHONE NUMBER: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_

CONTRACTOR'S ADDRESS: \_\_\_\_\_

CONTRACTOR'S PHONE NUMBER: \_\_\_\_\_

DESCRIPTION OF CONTRACT MODIFICATIONS:

REASON FOR CONTRACT MODIFICATIONS OR NEED FOR EXTRA WAORK:

TIME EXTENSION REQUIRED FOR THIS CHANGE ORDER:

ITEMIZATION OF CONTRACTOR'S PROPOSAL FOR THIS WORK:

AUTHORIZATIONS:

OWNER:

By: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

CONTRACTOR:

By: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

ARCHITECT/ENGINEER:

By: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

**END OF SECTION 00 44 00**



**AIA**<sup>®</sup>

# Document A101™ – 2017

## **Standard Form of Agreement Between Owner and Contractor** where the basis of payment is a Stipulated Sum

**AGREEMENT** made as of the     day of     in the year 2019  
*(In words, indicate day, month and year.)*

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

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

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

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

The Owner and Contractor agree as follows.

### **ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

The parties should complete A101™–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement.

AIA Document A201™–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Init.

**User Notes:**

(845769527)

## TABLE OF ARTICLES

1	THE CONTRACT DOCUMENTS
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### EXHIBIT A INSURANCE AND BONDS

#### ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

#### ARTICLE 2 THE WORK OF THIS CONTRACT

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

#### ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

*(Check one of the following boxes.)*

- The date of this Agreement.
- A date set forth in a notice to proceed issued by the Owner.
- Established as follows:  
*(Insert a date or a means to determine the date of commencement of the Work.)*

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

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

#### § 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

*(Check one of the following boxes and complete the necessary information.)*

Init.

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

[ ] As shown in the Proposal Form.

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

**Portion of Work**

**Substantial Completion Date**

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

**ARTICLE 4 CONTRACT SUM**

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be (\$ ), subject to additions and deductions as provided in the Contract Documents.

**§ 4.2 Alternates**

§ 4.2.1 Alternates, if any, included in the Contract Sum:

**Item**

**Price**

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.

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

**Item**

**Price**

**Conditions for Acceptance**

§ 4.3 Allowances, if any, included in the Contract Sum:

*(Identify each allowance.)*

**Item**

**Price**

§ 4.4 Unit prices, if any:

*(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)*

**Item**

**Units and Limitations**

**Price per Unit (\$0.00)**

§ 4.5 Liquidated damages, if any:

*(Insert terms and conditions for liquidated damages, if any.)*

§ 4.6 Other:

*(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)*

## ARTICLE 5 PAYMENTS

### § 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

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

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the Thirtieth day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the Twentieth day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Twenty ( 20 ) days after the Architect receives the Application for Payment.

*(Federal, state or local laws may require payment within a certain period of time.)*

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

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

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

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

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

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

### § 5.1.7 Retainage

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

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

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

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:  
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:  
(Insert any other conditions for release of retainage upon Substantial Completion.)

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

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

## § 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

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

No later than 30 days after the completion of the closeouts documents (including warranties).

## § 5.3 Interest

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

(Insert rate of interest agreed upon, if any.)

## ARTICLE 6 DISPUTE RESOLUTION

### § 6.1 Initial Decision Maker

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

**§ 6.2 Binding Dispute Resolution**

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

*(Check the appropriate box.)*

Arbitration pursuant to Section 15.4 of AIA Document A201–2017

Litigation in a court of competent jurisdiction

Other *(Specify)*

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

**ARTICLE 7 TERMINATION OR SUSPENSION**

**§ 7.1** The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

**§ 7.1.1** If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

*(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)*

No termination fee applied, only compensation for completed work expected.

**§ 7.2** The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

**ARTICLE 8 MISCELLANEOUS PROVISIONS**

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

**§ 8.2** The Owner’s representative:  
*(Name, address, email address, and other information)*

**§ 8.3** The Contractor’s representative:  
*(Name, address, email address, and other information)*



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

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

*(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)*

§ 8.7 Other provisions:

NA

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction

*(Paragraphs deleted)*

- .4 Drawings

Number

Title

Date

- .5 Specifications

Section

Title

Date

Pages

- .6 Addenda, if any:

Number

Date

Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

- .7 Other Exhibits:

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

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

Init.

[ ] The Sustainability Plan:

Title	Date	Pages
-------	------	-------

[ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
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.8 Other documents, if any, listed below:

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

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

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

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

\_\_\_\_\_  
(Printed name and title)

\_\_\_\_\_  
(Printed name and title)

# Additions and Deletions Report for AIA<sup>®</sup> Document A101<sup>™</sup> – 2017

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

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 12:16:49 on 05/02/2017.

## PAGE 1

**AGREEMENT** made as of the      day of      in the year 2019

...

...

\_\_\_\_\_

...

## PAGE 2

The date of this Agreement.

## PAGE 3

By the following date: \_\_\_\_\_

...

## PAGE 4

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the Thirtieth day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the Twentieth day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Twenty ( 20 ) days after the Architect receives the Application for Payment.

...

PAGE 5

...

...

PAGE 6

[ ] Litigation in a court of competent jurisdiction

...

...

...

PAGE 7

...

...

~~.4~~ AIA Document E203™ 2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

*(Insert the date of the E203 2013 incorporated into this Agreement.)*

~~.5~~ \_\_\_\_\_

~~.4~~ Drawings

...

~~.6~~ ~~.5~~ Specifications

...

~~7~~ 6 Addenda, if any:

...

~~8~~ 7 Other Exhibits:

PAGE 8

~~9~~ 8 Other documents, if any, listed below:

...

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## **Certification of Document's Authenticity**

**AIA® Document D401™ – 2003**

I, Vanessa Josephson, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 12:16:49 on 05/02/2017 under Order No. 2290503459\_1 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A101™ – 2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

---

*(Signed)*

---

*(Title)*

---

*(Dated)*

SECTION 00 61 13 – BONDS AND CERTIFICATES

PERFORMANCE BOND FORM

KNOW ALL MEN BY THESE PRESENTS: THAT

\_\_\_\_\_  
(CONTRACTOR) (ADDRESS)

AS PRINCIPAL, HEREINAFTER CALLED CONTRACTOR, AND

\_\_\_\_\_  
(Surety) (Address)

AS SURETY, HEREINAFTER CALLED SURETY, ARE HELD AND FIRMLY BOUND UNTO THE TOWN OF CAIRO,  
N.Y.,

AS OBLIGEE, HEREINAFTER CALLED OWNER, IN THE AMOUNT OF \_\_\_\_\_ Dollars (\$ \_\_\_\_\_ )

FOR THE PAYMENT WHEREOF CONTRACTOR AND SURETY BIND THEMSELVES, THEIR HEIRS, EXECUTORS,  
ADMINISTRATORS, SUCCESSORS, AND ASSIGNS, JOINTLY AND SEVERALLY, FIRMLY BY THESE  
PRESENTS.

WHEREAS,

CONTRACTOR HAS BY WRITTEN AGREEMENT DATED \_\_\_\_\_, 2019

ENTERED INTO A CONTRACT WITH OWNER FOR THE CONTRACT IN ACCORDANCE WITH DRAWINGS  
AND SPECIFICATIONS PREPARED BY KAATERSKILL ASSOCIATES, WHICH CONTRACT IS BY REFERENCE  
MADE A PART HEREOF, AND IS HEREINAFTER REFERRED TO AS THE CONTRACT.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT, IF THE CONTRACTOR SHALL  
PROMPTLY AND FAITHFULLY PERFORM SAID CONTRACT AND AGREEMENTS OF SAID CONTRACT  
DURING THE ORIGINAL TERM THEREOF, AND ANY EXTENSIONS THEREOF WHICH MAY BE GRANTED  
BY THE OWNER, WITH OR WITHOUT NOTICE TO THE SURETY AND DURING THE ONE YEAR  
GUARANTY PERIOD, AND IF HE SHALL SATISFY ALL CLAIMS AND DEMANDS INCURRED UNDER SUCH  
CONTRACT, AND SHALL FULLY INDEMNIFY AND HOLD HARMLESS THE OWNER FROM ALL COSTS  
AND DAMAGES WHICH THE OWNER MAY SUFFER BY REASON OF FAILURE TO DO SO, AND SHALL  
REIMBURSE AND REPAY THE OWNER ALL OUTLAY AND EXPENSE WHICH THE OWNER MAY INCUR  
IN MAKING GOOD ANY DEFAULT, THEN THIS OBLIGATION SHALL BE NULL AND VOID; OTHERWISE IT  
SHALL REMAIN IN FULL FORCE AND EFFECT.

WHENEVER CONTRACTOR SHALL BE, AND DECLARED BY OWNER TO BE IN DEFAULT UNDER THE  
CONTRACT, THE OWNER HAVING PERFORMED OWNER'S OBLIGATIONS THEREUNDER, THE SURETY  
SHALL PROMPTLY REMEDY THE DEFAULT BY (1) COMPLETING THE CONTRACT IN ACCORDANCE

WITH ITS TERMS AND CONDITIONS, OR (2) OBTAINING A BID OR BIDS FOR SUBMISSION TO THE OWNER FOR COMPLETING THE CONTRACT IN ACCORDANCE WITH ITS TERMS AND CONDITIONS, AND UPON DETERMINATION BY THE OWNER AND THE SURETY JOINTLY OF THE LOWEST RESPONSIBLE BIDDER, ARRANGE FOR A CONTRACT BETWEEN SUCH BIDDER AND OWNER, AND MAKE AVAILABLE AS WORK PROGRESSES (EVEN THOUGH THERE SHOULD BE A DEFAULT OR A SUCCESSION OF DEFAULTS UNDER THE CONTRACT OR CONTRACTS OF COMPLETION ARRANGED UNDER THIS PARAGRAPH) SUFFICIENT FUNDS TO PAY THE COST OF COMPLETION LESS THE BALANCE OF THE CONTRACT PRICE; BUT NOT EXCEEDING, INCLUDING OTHER COSTS AND DAMAGES FOR WHICH THE SURETY MAY BE LIABLE HEREUNDER, THE AMOUNT SET FORTH IN THE FIRST PARAGRAPH HEREOF THE TERM "BALANCE OF THE CONTRACT PRICE", AS USED IN THIS PARAGRAPH, SHALL MEAN THE TOTAL AMOUNT PAYABLE BY OWNER TO CONTRACTOR UNDER THE CONTRACT AND ANY AMENDMENTS THERETO, LESS THE AMOUNT PROPERTY PAID BY OWNER TO CONTRACTOR.

ANY SUIT UNDER THIS BOND MUST BE INSTITUTED BEFORE THE EXPIRATION OF TWO (2) YEARS FROM THE DATE ON WHICH FINAL PAYMENT UNDER THE CONTRACT FALLS DUE.

NO RIGHT OF ACTION SHALL ACCRUE ON THIS BOND TO OR FOR THE USE OF ANY PERSON, CORPORATION OR ENTITY OTHER THAN THE OWNER NAMED HEREIN OR THE HEIRS, EXECUTORS, ADMINISTRATORS OR SUCCESSORS OF THE OWNER.

IN WITNESS WHEREOF, THIS INSTRUMENT IS EXECUTED IN \_\_\_\_\_ COUNTERPARTS,  
EACH ONE OF

WHICH SHALL BE DEEMED AN ORIGINAL, THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_.

(CORPORATE SEAL IF APPLICABLE) \_\_\_\_\_

(OFFICER'S/PARTNER'S/INDIVIDUAL'S) SIGNATURE

\_\_\_\_\_  
(OFFICER'S/PARTNER'S/INDIVIDUAL'S) NAME PRINTED

\_\_\_\_\_  
(CORPORATION/PARTNERSHIP/INDIVIDUAL) NAME PRINTED (PRINCIPAL)

(CORPORATE SEAL IF APPLICABLE)

\_\_\_\_\_  
(OFFICER'S/PARTNER'S/INDIVIDUAL'S) SIGNATURE

\_\_\_\_\_  
(OFFICER'S/PARTNER'S/INDIVIDUAL'S) NAME PRINTED

\_\_\_\_\_  
(CORPORATION/PARTNERSHIP/INDIVIDUAL) NAME PRINTED (SURETY)



STATE of \_\_\_\_\_ )

COUNTY of \_\_\_\_\_ ) ss:

On this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_,

before me personally came to me known and known to me to be the person described in and who executed the foregoing instrument, and he/she duly acknowledged that he/she executed the same.

---

**NOTE: DATE OF BOND MUST NOT BE PRIOR TO DATE OF CONTRACT. IF CONTRACTOR IS A PARTNERSHIP ALL PARTNERS SHOULD EXECUTE THE BOND.**

**SURETY COMPANIES EXECUTING BONDS MUST BE AUTHORIZED TO DO BUSINESS IN NEW YORK STATE AND BE APPROVED BY THE OWNER'S ATTORNEY. ALL BONDS SHALL BE IN A FORM ACCEPTABLE IN ALL RESPECTS TO THE OWNER'S ATTORNEY AND SHALL BE APPROVED BY THE OWNER'S ATTORNEY.**

**END OF SECTION 00 61 13**



# AIA<sup>®</sup> Document A312<sup>™</sup> – 2010

## Payment Bond

**CONTRACTOR:**  
*(Name, legal status and address)*

**SURETY:**  
*(Name, legal status and principal place of business)*

**OWNER:**  
*(Name, legal status and address)*

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

**CONSTRUCTION CONTRACT**

Date:  
Amount: \$  
Description:  
*(Name and location)*

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

**BOND**

Date:  
*(Not earlier than Construction Contract Date)*

Amount: \$  
Modifications to this Bond:  None  See Section 18

**CONTRACTOR AS PRINCIPAL**  
Company: *(Corporate Seal)*

**SURETY**  
Company: *(Corporate Seal)*

Signature: \_\_\_\_\_  
Name and Title:

Signature: \_\_\_\_\_  
Name and Title:

*(Any additional signatures appear on the last page of this Payment Bond.)*

*(FOR INFORMATION ONLY — Name, address and telephone)*

**AGENT or BROKER:**

**OWNER'S REPRESENTATIVE:**  
*(Architect, Engineer or other party.)*

§ 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 shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 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 Section 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 shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

- .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
- .2 have sent a Claim to the Surety (at the address described in Section 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 Section 13).

§ 6 If a notice of non-payment required by Section 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 Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 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 Section 7.1 or Section 7.2 shall 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 Section 7.1 or Section 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 shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall 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 shall 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 satisfy 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 shall 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 Section 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 shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall 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 shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request 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:

- .1 the name of the Claimant;
- .2 the name of the person for whom the labor was done, or materials or equipment furnished;
- .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;
- .4 a brief description of the labor, materials or equipment furnished;
- .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;
- .6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- .7 the total amount of previous payments received by the Claimant; and
- .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 shall be to include without limitation in the terms "labor, materials or equipment" that part of 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 shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

*(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)*

**CONTRACTOR AS PRINCIPAL**

**SURETY**

Company: \_\_\_\_\_  
*(Corporate Seal)*

Company: \_\_\_\_\_  
*(Corporate Seal)*

Signature: \_\_\_\_\_  
Name and Title: \_\_\_\_\_  
Address: \_\_\_\_\_

Signature: \_\_\_\_\_  
Name and Title: \_\_\_\_\_  
Address: \_\_\_\_\_

## **SECTION 00 70 00 – GENERAL CONDITIONS**

### **FORM OF GENERAL CONDITIONS**

- 1.1 AIA Document A101 - 2017 - Standard Form of Agreement between Owner and Contractor
- 1.2 AIA Document A201 - 2007 - General Conditions of the Contract for Construction
- 1.3 The above documents are to be provided by the Contractor.

**END OF SECTION 00 70 00**

## **SECTION 00 80 00 – SUPPLEMENTARY CONDITIONS**

### **PART 1: INTENT**

- 1.1 These Supplementary Conditions amend and supplement the General Conditions defined in Document 007000 and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.
- 1.2 The terms used in these Supplementary Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

### **PART 2: ADDITIONAL ARTICLE - DEFINITIONS**

- 2.1 Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work, but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
- 2.2 Furnish or Supply: To supply and deliver, unload, inspect for damage.
- 2.3 Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, and ready for use.
- 2.4 Provide: To furnish or supply, plus install.
- 2.5 Project Manual: The Project Manual is the volume usually assembled for the Work which includes the Bid Documents, Contract Documents, and Specifications.
- 2.6 For the purposes of this specification the terms “General Contractor” and “Construction Manager” are the same entity.

**END OF SECTION 00 80 00**

## SECTION 011000 – SUMMARY

### PART 1 - GENERAL

#### 1.1 PROJECT DESCRIPTION

- A. This project generally consists of the following:
  - 1. Provide a new modular/manufactured building (& design) by others (concept provided).
    - a. Provide sealed compliance verification documents for review and approval.
  - 2. Construction of a new ambulance garage.
  - 3. Site work: excavation & backfill, regrading, pavement, etc.
  - 4. Refer to drawings and project manual for detailed instructions.

#### 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.3 SUMMARY

- A. Section Includes:
  - 1. Project information.
  - 2. Work covered by Contract Documents.
  - 3. Work by Owner.
  - 4. Owner-furnished products.
  - 5. Owner -furnished, Contractor-installed products.
  - 6. Access to site.
  - 7. Coordination with occupants.
  - 8. Work restrictions.
  - 9. Specification and drawing conventions.
- B. Related Requirements:
  - 1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

#### 1.4 PROJECT INFORMATION

- A. Project Identification: 80217.21 Town of Cairo Ambulance
  - 1. Project Location:
    - a. 25 Railroad Avenue, Cairo, NY 12413.
- B. Owner: Town of Cairo
  - PO Box 728
  - 512 Main Street
  - Cairo, NY 12413
  - 1. Owner's Representative:
    - John Coyne, Supervisor
    - PO Box 728
    - 512 Main Street
    - Cairo, NY 12413
    - (518) 622-3120 x113
    - [supervisor@townofcairo.com](mailto:supervisor@townofcairo.com)



- C. Engineer: Kaaterskill Associates  
William A. Scribner, PE  
517 Main Street  
Cairo, N.Y. 12413  
Ph: (518) 622-9667 Fax: (518) 622-9047  
Email: b.scribner@keaeng,.com

1.5 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
  - 1. See Drawings and Project Manual & Specifications for work scopes and details.

1.6 WORK BY OWNER

- A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

1.7 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Limits: Confine construction operations to area designated on drawings.
  - 2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

1.8 COORDINATION WITH OCCUPANTS

- A. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
  - 1. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
  - 2. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
  - 3. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.9 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work into Contractor's normal business working hours of Monday through Saturday, unless otherwise indicated.

- C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise, vibration, odors, or other disruption to Owner occupancy of temporary banking trailer on-site with Owner.
- D. Non-smoking Buildings: Smoking is not permitted within the buildings or within 25 feet of entrances, operable windows, or outdoor-air intakes.
- E. Controlled Substances: Use of tobacco products and other controlled substances within the building is not permitted.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
  - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

**END OF SECTION 01 10 00**

## SECTION 011600 - SAFETY

### PART 1: GENERAL

SECTION INCLUDES – The following scope of work.

- A. Drawings and applicable requirements of Conditions of the Contract including General and Supplementary and of other Division 1 Specification Sections listed under General Requirements apply to Work of this Section as determined by CONTRACTOR.
- B. Work Included:
  - 1. Each Subcontractor shall be totally responsible for instituting, maintaining, and enforcing a job site safety program and shall comply with all applicable federal, state and local regulations.

### PART 2: GENERAL RESPONSIBILITY

- A. Contractor shall take all reasonable safety precautions with respect to his Work, shall comply with all safety measures initiated by CONTRACTOR and with all applicable laws, ordinances, rules, regulations and orders of any governmental agency or political subdivision for the safety of persons or property. The contractor shall report within three days to ARCHITECT/ENGINEERS any injury to any of the Subcontractor's employees at the Site.
- B. The following list of general safety requirements are to be enforced to protect the Owner's, Architect's, Engineer's, and contractor's personnel from serious injury as well as the Subcontractor's own personnel. These requirements are not intended to replace any other laws or ordinances in effect at the time of execution of this agreement but shall merely serve as a supplement to those requirements.
  - a. Personal Automobiles - Personal automobiles shall be parked in specified locations. No parking on the site will be allowed without prior approval of OWNER.
  - b. General Housekeeping - The job site must be kept clean and orderly. Side walks, entrances, passageways and stairs kept clear, projecting nails removed, and scrap and debris removed at regular intervals, by respective contractors.
  - c. Trash Fires - Fires for burning of trash or rubbish are prohibited.
  - d. Barricades - Barricades and adequate signs are required to keep personnel away from hazardous areas such as excavations, overhead work, etc. by contractor. Barricade signs by CONTRACTOR.
  - e. Temporary Lighting - Construction areas are to be lighted to at least five (5) foot candles by Contractor.
  - f. Safety Meetings - Weekly "Tool Box Talks" must be conducted by each Contractor for his employees with a report listing the attendees, topics discussed, and comments made, submitted to CONTRACTOR.
  - g. Personal Protective Gear - In addition to the OSHA requirements, all subcontractor's employees shall at all times wear hard hats and safety glasses must be worn whenever work is performed that could endanger eyesight.
  - h. Job Cleanup - Each Subcontractor shall maintain in force during the duration of their work, a daily cleanup program. This includes but is not limited to: picking up all scrap materials, sweeping up their work areas, and removing rubbish from site on a daily basis. Should any Subcontractor not maintain their work areas in a neat, orderly, to CONTRACTOR'S satisfaction, CONTRACTOR reserves the right to employ forces on the Owner's behalf to do the cleanup. Any accumulated charges will be filed as a change order to the violating party.

**END OF SECTION 01 16 00**

## SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General coordination procedures.
  - 2. Coordination drawings.
  - 3. Requests for Information (RFIs).
  - 4. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
  - 1. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
  - 2. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

#### 1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect/Engineer, or Contractor seeking information required by or clarifications of the Contract Documents.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. **Use CSI Form 1.5A.** Include the following information in tabular form:
  - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
  - 2. Number and title of related Specification Section(s) covered by subcontract.
  - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within **[15]** days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
  - 1. Post copies of list in project meeting room, in temporary field office and by each temporary telephone. Keep list current at all times.

#### 1.5 GENERAL COORDINATION PROCEDURES (if applicable)

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate

construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
  2. Preparation of the schedule of values.
  3. Installation and removal of temporary facilities and controls.
  4. Delivery and processing of submittals.
  5. Progress meetings.
  6. Pre-installation conferences.
  7. Project closeout activities.
  8. Startup and adjustment of systems.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

#### 1.6 COORDINATION DRAWINGS (if applicable)

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
  - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
  - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
  - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
  - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
  - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
  - f. Indicate required installation sequences.
  - g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect/Engineer indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
  1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
  2. Plenum Space: Indicate sub-framing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
  3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
  4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
  6. Mechanical and Plumbing Work: Show the following:
    - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    - c. Fire-rated enclosures around ductwork.
  7. Electrical Work: Show the following:
    - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.

- b. Light fixture exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
      - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
      - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
    - 8. Fire-Protection System: Show the following:
      - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
    - 9. Review: Architect/Engineer will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
    - 10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Division 01 Section "Submittal Procedures."
  - C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
    - 1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
    - 2. File Preparation Format: [DWG], operating in [Microsoft Windows] operating system.
    - 3. File Submittal Format: Submit or post coordination drawing files using [format same as file preparation format] [Portable Data File (PDF) format].
- 1.7 REQUESTS FOR INFORMATION (RFIs)
- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
    - 1. Architect/Engineer will return RFIs submitted to Architect/Engineer by other entities controlled by Contractor with no response.
    - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
  - B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
    - 1. Project name.
    - 2. Project number.
    - 3. Date.
    - 4. Name of Contractor.
    - 5. Name of Architect/Engineer.
    - 6. RFI number, numbered sequentially.
    - 7. RFI subject.
    - 8. Specification Section number and title and related paragraphs, as appropriate.
    - 9. Drawing number and detail references, as appropriate.
    - 10. Field dimensions and conditions, as appropriate.
    - 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
    - 12. Contractor's signature.
    - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

- a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
  - C. RFI Forms: AIA Document G716 or Software-generated form with substantially the same content as indicated above, acceptable to Architect/Engineer.
    - 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
  - D. Architect/Engineer Action: Architect/Engineer will review each RFI, determine action required, and respond. Allow [seven] 7 working days for Architect's response for each RFI. RFIs received by Architect/Engineer after 1:00 p.m. will be considered as received the following working day.
    - 1. The following Contractor-generated RFIs will be returned without action:
      - a. Requests for approval of submittals.
      - b. Requests for approval of substitutions.
      - c. Requests for approval of Contractor's means and methods.
      - d. Requests for coordination information already indicated in the Contract Documents.
      - e. Requests for adjustments in the Contract Time or the Contract Sum.
      - f. Requests for interpretation of Architect/Engineer's actions on submittals.
      - g. Incomplete RFIs or inaccurately prepared RFIs.
    - 2. Architect/Engineer action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
    - 3. Architect/Engineer action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
      - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within [10] days of receipt of the RFI response.
  - E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use CSI Log Form 13.2B. Include the following:
    - 1. Project name.
    - 2. Name and address of Contractor.
    - 3. Name and address of Architect/Engineer.
    - 4. RFI number including RFIs that were returned without action or withdrawn.
    - 5. RFI description.
    - 6. Date the RFI was submitted.
    - 7. Date Architect/Engineer's response was received.
  - F. On receipt of Architect/Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within [seven] days if Contractor disagrees with response.
    - 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
    - 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.
- 1.8 PROJECT MEETINGS
- A. General: Contractor will schedule and conduct meetings and conferences at Project site unless otherwise indicated.



1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect/Engineer of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within [three] days of the meeting.
- B. Preconstruction Conference: Contractor will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than [15] days after execution of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.
  2. Attendees: Authorized representatives of Owner, Architect/Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  3. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Lines of communications.
    - f. Procedures for processing field decisions and Change Orders.
    - g. Procedures for RFIs.
    - h. Procedures for testing and inspecting.
    - i. Procedures for processing Applications for Payment.
    - j. Distribution of the Contract Documents.
    - k. Submittal procedures.
    - l. Preparation of record documents.
    - m. Use of the premises.
    - n. Work restrictions.
    - o. Working hours.
    - p. Owner's occupancy requirements.
    - q. Responsibility for temporary facilities and controls.
    - r. Procedures for moisture and mold control.
    - s. Procedures for disruptions and shutdowns.
    - t. Construction waste management and recycling.
    - u. Parking availability.
    - v. Office, work, and storage areas.
    - w. Equipment deliveries and priorities.
    - x. First aid.
    - y. Security.
    - z. Progress cleaning.
  4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and

- installations that have preceded or will follow, shall attend the meeting. Advise Architect/Engineer and Owner of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility requirements.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written instructions.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.
    - w. Required performance results.
    - x. Protection of adjacent work.
    - y. Protection of construction and personnel.
  3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Contractor will schedule and conduct a project closeout conference, at a time convenient to Owner and Architect/Engineer, but no later than [90] days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
  2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
    - a. Preparation of record documents.

- b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
  - c. Submittal of written warranties.
  - d. Requirements for preparing operations and maintenance data.
  - e. Requirements for delivery of material samples, attic stock, and spare parts.
  - f. Requirements for demonstration and training.
  - g. Preparation of Contractor's punch list.
  - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
  - i. Submittal procedures.
  - j. Coordination of separate contracts.
  - k. Owner's partial occupancy requirements.
  - l. Installation of Owner's furniture, fixtures, and equipment.
  - m. Responsibility for removing temporary facilities and controls.
4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Contractor will conduct progress meetings at weekly intervals or as determined by Architect/Engineer.
- 1. Coordinate dates of meetings with preparation of payment requests.
  - 2. Attendees: In addition to representatives of Owner and Architect/Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Resolution of BIM component conflicts.
      - 4) Status of submittals.
      - 5) Deliveries.
      - 6) Off-site fabrication.
      - 7) Access.
      - 8) Site utilization.
      - 9) Temporary facilities and controls.
      - 10) Progress cleaning.
      - 11) Quality and work standards.
      - 12) Status of correction of deficient items.
      - 13) Field observations.

- 14) Status of RFIs.
  - 15) Status of proposal requests.
  - 16) Pending changes.
  - 17) Status of Change Orders.
  - 18) Pending claims and disputes.
  - 19) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- F. Coordination Meetings: Contractor will conduct Project coordination meetings at weekly intervals or as determined by Architect/Engineer. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.
- 1. Attendees: In addition to representatives of Owner and Architect/Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
    - c. Review present and future needs of each contractor present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Resolution of BIM component conflicts.
      - 4) Status of submittals.
      - 5) Deliveries.
      - 6) Off-site fabrication.
      - 7) Access.
      - 8) Site utilization.
      - 9) Temporary facilities and controls.
      - 10) Work hours.
      - 11) Hazards and risks.
      - 12) Progress cleaning.
      - 13) Quality and work standards.

- 14) Change Orders.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

**END OF SECTION 013100**

## SECTION 013300 - SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
  - 1. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
  - 2. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
  - 3. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 4. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

#### 1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect/Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

#### 1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect/Engineer and additional time for handling and reviewing submittals required by those corrections.
  - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  - 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

- a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
- a. Scheduled date for first submittal.
  - b. Specification Section number and title.
  - c. Submittal category: Action; informational.
  - d. Name of subcontractor.
  - e. Description of the work covered.
  - f. Scheduled date for Architect/Engineer's final release or approval.
  - g. Scheduled date of fabrication.
  - h. Scheduled dates for purchasing.
  - i. Scheduled dates for installation.
  - j. Activity or event number.

#### 1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect/Engineer's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect/Engineer for Contractor's use in preparing submittals.
  - 1. Architect/Engineer will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
    - a. Architect/Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    - b. Digital Drawing Software Program: The Contract Drawings are available in AutoCAD.
    - c. Contractor shall execute a data licensing agreement in the form of AIA Document C106, Digital Data Licensing Agreement.
    - d. The following digital data files will be furnished for each appropriate discipline:
      - 1) Floor plans.
      - 2) Reflected ceiling plans.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  - 4. Coordinate transmittal of different types of submittals for related parts of the work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect/Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect/Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect/Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 15 days for review of each resubmittal.
  4. Sequential Review: Where sequential review of submittals by Architect/Engineer's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
  5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect/Engineer and to Architect/Engineer's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect/Engineer before being returned to Contractor.
- D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
  2. Name file with submittal number or other unique identifier, including revision identifier.
    - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
  3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect/Engineer.
  4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect/Engineer.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of firm or entity that prepared submittal.
    - g. Names of subcontractor, manufacturer, and supplier.
    - h. Category and type of submittal.
    - i. Submittal purpose and description.
    - j. Specification Section number and title.
    - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
    - l. Drawing number and detail references, as appropriate.
    - m. Location(s) where product is to be installed, as appropriate.
    - n. Related physical samples submitted directly.
    - o. Indication of full or partial submittal.
    - p. Transmittal number numbered consecutively.
    - q. Submittal and transmittal distribution record.
    - r. Other necessary identification.
    - s. Remarks.



5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
  - a. Project name.
  - b. Number and title of appropriate specification section.
  - c. Manufacturer name.
  - d. Product name.
- E. Options: Identify options requiring selection by Architect/Engineer.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect/Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
  1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Architect/Engineer's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect/Engineer's action stamp.

## **PART 2 - PRODUCTS**

### **2.1 SUBMITTAL PROCEDURES**

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
  1. Submit electronic submittals via email as PDF electronic files.
    - a. Architect/Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
  2. Action Submittals: Submit four paper copies of each submittal unless otherwise indicated. Architect/Engineer will return two copies.
  3. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect/Engineer will not return copies.
  4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect/Engineer's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional Architect/Engineer if specified.
  2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 24 by 36 inches.
  3. Submit Shop Drawings in the following format:
    - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of samples that includes the following:
    - a. Generic description of sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable specification section.
    - e. Specification paragraph number and generic name of each item.

3. For projects where electronic submittals are required, provide corresponding electronic submittal of sample transmittal, digital image file illustrating sample characteristics, and identification information for record.
4. Disposition: Maintain sets of approved samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
  - a. Samples that may be incorporated into the Work are indicated in individual specification sections. Such samples must be in an undamaged condition at time of use.
  - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
  - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect/Engineer will return submittal with options selected.
6. Samples for Verification: Submit full-size units or samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
  - a. Number of Samples: Submit three sets of Samples. Architect/Engineer will retain two sample sets; remainder will be returned.
    - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
    - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual specification sections, prepare a written summary indicating types of products required for the work and their intended location. Include the following information in tabular form:
  1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
  2. Manufacturer and product name, and model number if applicable.
  3. Number and name of room or space.
  4. Location within room or space.
  5. Submit product schedule in the following format:
    - a. PDF electronic file.
- F. Coordination Drawing Submittals: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

- H. Application for Payment and Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
- K. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- L. LEED Submittals: Comply with requirements specified in Division 01 sustainable design requirements Section.
- M. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- N. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- O. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- P. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- Q. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- R. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- S. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- T. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- U. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - 1. Name of evaluation organization.
  - 2. Date of evaluation.
  - 3. Time period when report is in effect.
  - 4. Product and manufacturers' names.
  - 5. Description of product.
  - 6. Test procedures and results.
  - 7. Limitations of use.
- V. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

- W. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
  - X. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
  - Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- 2.2 DELEGATED-DESIGN SERVICES
- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
    - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect/Engineer.
  - B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
    - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

### **PART 3 - EXECUTION**

#### **3.1 CONTRACTOR'S REVIEW**

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect/Engineer.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

**END OF SECTION 01 33 00**

## SECTION 014000 - QUALITY REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect/Engineer, Owner or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Requirements:
  - 1. Divisions 02 through 33 Sections for specific test and inspection requirements.

#### 1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect/Engineer.
- C. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

- D. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- E. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- I. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

#### 1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect/Engineer for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect/Engineer for a decision before proceeding.

#### 1.5 ACTION SUBMITTALS

- A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
  - 1. Indicate manufacturer and model number of individual components.
  - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Entity responsible for performing tests and inspections.
  - 3. Description of test and inspection.
  - 4. Identification of applicable standards.
  - 5. Identification of test and inspection methods.
  - 6. Number of tests and inspections required.
  - 7. Time schedule or time span for tests and inspections.
  - 8. Requirements for obtaining samples.
  - 9. Unique characteristics of each quality-control service.

## 1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 14 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect/Engineer. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
  - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
  - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.



2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
  3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect/Engineer has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

## 1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
  2. Project title and number.
  3. Name, address, and telephone number of testing agency.
  4. Dates and locations of samples and tests or inspections.
  5. Names of individuals making tests and inspections.
  6. Description of the Work and test and inspection method.
  7. Identification of product and Specification Section.
  8. Complete test or inspection data.
  9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and re-inspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Statement that products at Project site comply with requirements.
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.

5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  6. Statement whether conditions, products, and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
  2. Statement that equipment complies with requirements.
  3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  4. Statement whether conditions, products, and installation will affect warranty.
  5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

## 1.9 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
    - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
    - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
  2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect/Engineer, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

## 1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
  3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  3. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspecting will be performed.
  4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Re-testing/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-

inspecting, for construction that replaced Work that failed to comply with the Contract Documents.

- F. Testing Agency Responsibilities: Cooperate with Architect/Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect/Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Architect/Engineer, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

### 1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Statement of Special Inspections included in the document, and as follows:
- B. Special Tests and Inspections: Conducted by a qualified special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:
  - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
  - 2. Notifying Architect/Engineer and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  - 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect/Engineer with copy to Contractor and to authorities having jurisdiction.
  - 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  - 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  - 6. Retesting and re-inspecting corrected work.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### 3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
  - 1. Date test or inspection was conducted.
  - 2. Description of the Work tested or inspected.
  - 3. Date test or inspection results were transmitted to Architect/Engineer.
  - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect/Engineer 's reference during normal working hours.

### 3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

**END OF SECTION 014000**

## SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
  - 1. Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.
  - 2. Division 31 Section "Dewatering" for disposal of ground water at Project site.
  - 3. Division 32 Section "Concrete Paving" for construction and maintenance of cement concrete pavement for temporary roads and paved areas.

#### 1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect/Engineer, testing agencies, and authorities having jurisdiction.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion and Sedimentation-Control Plan: Show compliance with requirements of DEC Construction General Permit or authorities having jurisdiction, whichever is more stringent.

#### 1.5 QUALITY ASSURANCE

- A. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- B. Accessible Temporary Egress: Comply with applicable provisions in ICC/ANSI A117.1.



## 1.6 PROJECT CONDITIONS

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

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide concrete bases for supporting posts.

### 2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

### 2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
  1. Maintain support facilities until Architect/Engineer schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
  2. Provide dust-control treatment that is nonpolluting and non-tracking. Reapply treatment as required to minimize dust.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
  1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  2. Maintain access for fire-fighting equipment and access to fire hydrants.
- C. Parking: Provide temporary parking areas for construction personnel.
- D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
  1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
  2. Remove snow and ice as required to minimize accumulations.
- E. Project Signs: Unauthorized signs are not permitted.
- F. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."
- G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Division 01 Section "Execution."
- H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
  1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
  - 1. Comply with work restrictions specified in Division 01 Section "Summary."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings.
  - 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
  - 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
  - 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
  - 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Tree and Plant Protection: Comply with requirements specified in Division 01 Section "Temporary Tree and Plant Protection."
- F. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- I. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- J. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate completed areas from fumes and noise.
  - 1. Construct dustproof partitions with two layers of 6-mil (0.14-mm) polyethylene sheet on each side. Cover floor with two layers of 6-mil (0.14-mm) polyethylene sheet, extending

sheets 18 inches up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.

- a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches between doors. Maintain water-dampened foot mats in vestibule.
  2. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
  3. Protect air-handling equipment.
  4. Provide walk-off mats at each entrance through temporary partition.
- K. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Prohibit smoking in construction areas.
  2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  3. Develop and supervise an overall fire-prevention and fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

### 3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
  2. Protect stored and installed material from flowing or standing water.
  3. Keep porous and organic materials from coming into prolonged contact with concrete.
  4. Remove standing water from decks.
  5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
  2. Keep interior spaces reasonably clean and protected from water damage.
  3. Periodically collect and remove waste containing cellulose or other organic matter.
  4. Discard or replace water-damaged material.
  5. Do not install material that is wet.

6. Discard, replace, or clean stored or installed material that begins to grow mold.
  7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
  2. Use permanent HVAC system to control humidity.
  3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
    - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
    - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect/Engineer.
    - c. Remove materials that can not be completely restored to their manufactured moisture level within 48 hours.

### 3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
  1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
  2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for

fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

**END OF SECTION 015000**

## SECTION 016000 - PRODUCT REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

#### 1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

#### 1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product 7 days prior to bid submission. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
  2. Architect/Engineer's Action: If necessary, Architect/Engineer will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect/Engineer will notify Contractor of approval or rejection of proposed comparable product request within 3 days of receipt of request, or 3 days of receipt of additional information or documentation, whichever is later.
    - a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
    - b. Use product specified only if Architect/Engineer issues a decision on use of a comparable product request.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

#### 1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
  2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect/Engineer will determine which products shall be used.

#### 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:



1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

## 1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
  1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
  2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
  1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
  3. See Divisions 02 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

## PART 2 - PRODUCTS

### 2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect/Engineer will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
  - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
  - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
4. Manufacturers:
  - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
  - b. Non-restricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect/Engineer's sample", provide a product that complies with requirements and matches Architect/Engineer's sample. Architect/Engineer's decision will be final on whether a proposed product matches.
  1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect/Engineer will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect/Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
  1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
  2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  3. Evidence that proposed product provides specified warranty.
  4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
  5. Samples, if requested.

## **PART 3 - EXECUTION (Not Used)**

**END OF SECTION 016000**

## SECTION 017300 - EXECUTION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Cutting and patching.
  - 5. Coordination of Owner-installed products.
  - 6. Progress cleaning.
  - 7. Starting and adjusting.
  - 8. Protection of installed construction.
  - 9. Correction of the Work.
- B. Related Requirements:
  - 1. Division 01 Section "Summary" for limits on use of Project site.
  - 2. Division 01 Section "Submittal Procedures" for submitting surveys.
  - 3. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
  - 4. Division 07 Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

#### 1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
  - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
  - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
  - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
  - 4. Dates: Indicate when cutting and patching will be performed.
  - 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
    - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- C. Final Property Survey: Submit three copies showing the Work performed and record survey data and one copy of data file in AutoCAD format.

#### 1.5 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
  - 1. Structural Elements: When cutting and patching structural elements, notify Architect/Engineer of locations and details of cutting and await directions from Architect/Engineer before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
  - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
    - a. Primary operational systems and equipment.
    - b. Operating systems of special construction.
  - 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

- a. Water, moisture, or vapor barriers.
  - b. Membranes and flashings.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect/Engineers's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. General: Comply with requirements specified in other Sections.
1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in Division 01 sustainable design requirements Section.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect/Engineer for the visual and functional performance of in-place materials.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities, and other construction affecting the Work. Contact "Dig Safely New York."

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with installer or applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
1. Description of the Work.
  2. List of detrimental conditions, including substrates.
  3. List of unacceptable installation tolerances.
  4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control

of Contractor, submit a request for information to Architect/Engineer according to requirements in Division 01 Section "Project Management and Coordination."

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
  - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
  - 2. Establish limits on use of Project site.
  - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  - 4. Inform installers of lines and levels to which they must comply.
  - 5. Check the location, level and plumb, of every major element as the Work progresses.
  - 6. Notify Architect/Engineer when deviations from required lines and levels exceed allowable tolerances.
  - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect/Engineer.

### 3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
  - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect/Engineer. Report lost or destroyed permanent benchmarks or



- control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
  2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
  3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
  2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

### 3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
  2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect/Engineer.
  - 2. Allow for building movement, including thermal expansion and contraction.
  - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Division 01 Section "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
  - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
  - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### 3.7 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.

- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
  - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
  - 2. Pre-installation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend pre-installation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

### 3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Use containers intended for holding waste materials of type to be stored.
  - 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Section "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

### 3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

**END OF SECTION 017300**

## SECTION 01 73 20 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
  - 1. Salvaging nonhazardous construction waste.
  - 2. Recycling nonhazardous construction waste.
  - 3. Disposing of nonhazardous construction waste.
- B. Related Requirements:
  - 1. Division 04 Section "Masonry" for disposal requirements for masonry waste.
  - 2. Division 06 Section "Wood, Plastics, & Composites" for disposition of waste.

#### 1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, demolition or repair operations. Construction waste includes packaging.
- B. Disposal: Removal off-site of construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- C. Recycle: Recovery of construction waste for subsequent processing in preparation for reuse.
- D. Salvage: Recovery of construction waste and subsequent sale or reuse in another facility.
- E. Salvage and Reuse: Recovery of construction waste and subsequent incorporation into the Work.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 75 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials including the following:

1. Construction Waste:

- a. Masonry and CMU.
- b. Lumber.
- c. Wood sheet materials.
- d. Wood trim.
- e. Metals.
- f. Roofing.
- g. Insulation.
- h. Carpet and pad.
- i. Gypsum board.
- j. Piping.
- k. Electrical conduit.
- l. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
  - 1) Paper.
  - 2) Cardboard.
  - 3) Boxes.
  - 4) Plastic sheet and film.
  - 5) Polystyrene packaging.
  - 6) Wood crates.
  - 7) Plastic pails.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 14 days of date established for the Notice to Proceed.

1.6 INFORMATIONAL SUBMITTALS

- A. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- B. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- C. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- D. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

## 1.7 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
  - 1. Review and discuss waste management plan including responsibilities of waste management coordinator.
  - 2. Review requirements for documenting quantities of each type of waste and its disposition.
  - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
  - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
  - 5. Review waste management requirements for each trade.

## 1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Use Form CWM-1 for construction waste. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Use Form CWM-3 for construction waste. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
  - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
  - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.



5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Use Form CWM-5 for construction waste. Include the following:
1. Total quantity of waste.
  2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
  3. Total cost of disposal (with no waste management).
  4. Revenue from salvaged materials.
  5. Revenue from recycled materials.
  6. Savings in hauling and tipping fees by donating materials.
  7. Savings in hauling and tipping fees that are avoided.
  8. Handling and transportation costs. Include cost of collection containers for each type of waste.
  9. Net additional cost or net savings from waste management plan.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
  1. Comply with operation, termination, and removal requirements in Division 01 Section "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
  1. Distribute waste management plan to everyone concerned within 7 days of submittal return.
  2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
  - 2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.
- E. Contractor's quantitative reports for demolition waste materials generated by the off-site Recyclable sorting facility, as a condition of approval of progress payments.

### 3.2 RECYCLING CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall be shared equally by Owner and Contractor.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
  - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
    - a. Inspect containers and bins for contamination and remove contaminated materials if found.
  - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
  - 4. Store components off the ground and protect from the weather.
  - 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

### 3.3 RECYCLING CONSTRUCTION WASTE

- A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
  - a. Comply with requirements in Division 32 Section "Plants." for use of clean sawdust as organic mulch.

C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
  - a. Comply with requirements in Division 32 Section "Plants." for use of clean ground gypsum board as inorganic soil amendment.

### 3.4 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Burning of waste materials is not permitted.
- C. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.
- D. Disposal: Remove waste materials from Owner's property and legally dispose of them.

**END OF SECTION 01 73 20**

**END OF SECTION 01 73 20**

## SECTION 017700 - CLOSEOUT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.
- B. Related Requirements:
  - 1. Division 01 Section "Execution" for progress cleaning of Project site.
  - 2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 3. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 4. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
  - 5. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

## 1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

## 1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  - 3. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Submit maintenance material submittals specified in individual Divisions 02 through 33 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect/Engineer. Label with manufacturer's name and model number where applicable.
    - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect/Engineer's signature for receipt of submittals.
  - 5. Submit test/adjust/balance records.
  - 6. Submit sustainable design submittals required in Division 01 sustainable design requirements Section and in individual Division 02 through 33 Sections.
  - 7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Advise Owner of pending insurance changeover requirements.
  - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems as per the commissioning authority.
6. Advise Owner of changeover in heat and other utilities.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect/Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect/Engineer, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

## 1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect/Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect/Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect/Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

## 1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order.
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  3. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Architect/Engineer.
    - d. Name of Contractor.
    - e. Page number.
  4. Submit list of incomplete items in the following format:
    - a. MS Excel electronic file. Architect/Engineer will return annotated file.

## 1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect/Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
  4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.



- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

## **PART 3 - EXECUTION**

### **3.1 FINAL CLEANING**

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - e. Remove snow and ice to provide safe access to building.
    - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
  - h. Sweep concrete floors broom clean in unoccupied spaces.
  - i. Remove labels that are not permanent.
  - j. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Construction Waste Management and Disposal."

### 3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to the specified condition.
  - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
  - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
  - 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

**END OF SECTION 01 77 00**

## SECTION 017839 - PROJECT RECORD DOCUMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
  - 4. Miscellaneous record submittals.
- B. Related Requirements:
  - 1. Division 01 Section "Execution" for final property survey.
  - 2. Division 01 Section "Closeout Procedures" for general closeout procedures.
  - 3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 4. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

#### 1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit one set(s) of marked-up record prints.
  - 2. Number of Copies: Submit copies of record Drawings as follows:
    - a. Initial Submittal:
      - 1) Submit one paper-copy set(s) of marked-up record prints.
      - 2) Submit PDF electronic files of scanned record prints and one of file prints.
      - 3) Submit record digital data files and one set(s) of plots.
      - 4) Architect/Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
    - b. Final Submittal:
      - 1) Submit one paper-copy set(s) of marked-up record prints.
      - 2) Submit record digital data files and three set(s) of record digital data file plots.
      - 3) Plot each drawing file, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy of each submittal.
  - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

## **PART 2 - PRODUCTS**

### **2.1 RECORD DRAWINGS**

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
  - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an acceptable drawing technique.
    - c. Record data as soon as possible after obtaining it.
    - d. Record and check the markup before enclosing concealed installations.
    - e. Cross-reference record prints to corresponding archive photographic documentation.
  - 2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Depths of foundations below first floor.
    - d. Locations and depths of underground utilities.
    - e. Revisions to routing of piping and conduits.
    - f. Revisions to electrical circuitry.
    - g. Actual equipment locations.
    - h. Duct size and routing.
    - i. Locations of concealed internal utilities.
    - j. Changes made by Change Order or Construction Change Directive.
    - k. Changes made following Architect/Engineer 's written orders.
    - l. Details not on the original Contract Drawings.
    - m. Field records for variable and concealed conditions.
    - n. Record information on the Work that is shown only schematically.
  - 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  - 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  - 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
  - 5. Note related Change Orders and record Drawings where applicable.
- B. Format: Submit record Specifications as paper copy.

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as paper copy.
  - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as paper copy.
  - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

## **PART 3 - EXECUTION**

### 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect/Engineer 's reference during normal working hours.

**END OF SECTION 017839**

## SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

### 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 cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
  - 1. Footings.
  - 2. Foundation walls.
  - 3. Slabs-on-grade.
  - 4. Ramps.
  - 5. Sidewalks.
- B. Related Sections:
  - 1. Division 32 Section "Concrete Paving Joint Sealants" for concrete pavement and walks.

#### 1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.
- B. Supplementary Cementitious Materials (SCM): Fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements which are to be used in combination with Portland Cement.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

### PART 2 - PRODUCTS

#### 2.1 FORM-FACING MATERIALS

- A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

#### 2.2 STEEL REINFORCEMENT

- A. Recycled Content of Steel Products: Provide rebar with an average recycled content of steel products so postconsumer recycled content plus one-half of pre-consumer recycled content is not less than 90 percent. For other steel products the recycled content should be not less than 50%.

## 2.3 REINFORCEMENT ACCESSORIES

- A. Reinforcing Bars: ASTM A 615, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Reinforcing bars are to be galvanized.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
  - 1. For concrete surfaces exposed to view where legs of wire bar support contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

## 2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement: ASTM C 150, **Type I, supplement with the following:**
    - a. Fly Ash: ASTM C 618, **Class F or C.**
    - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
  - 2. Blended Hydraulic Cement: ASTM C 595, cement.
- B. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33, coarse aggregate or better, graded. Provide aggregates from a single source [**with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials**].
  - 1. Maximum Coarse-Aggregate Size: **1-1/2 inches** nominal.
  - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Water: ASTM C 94/C 94M [ **and potable**].

## 2.5 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
  - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
  - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

## 2.6 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
  - 1. Products: Subject to compliance with requirements, **provide one of the following:**
    - a. Axim Italcementi Group, Inc.; CATEXOL CimFilm.
    - b. BASF Construction Chemicals - Building Systems; Confilm.
    - c. ChemMasters; SprayFilm.
    - d. Conspec by Dayton Superior; Aquafilm.
    - e. Dayton Superior Corporation; Sure Film (J-74).

- f. Edoco by Dayton Superior; BurkeFilm.
  - g. Euclid Chemical Company (The), an RPM company; Eucobar.
  - h. Kaufman Products, Inc.; Vapor-Aid.
  - i. Lambert Corporation; LAMBCO Skin.
  - j. L&M Construction Chemicals, Inc.; E-CON.
  - k. Meadows, W. R., Inc.; EVAPRE.
  - l. Metalcrete Industries; Waterhold.
  - m. Nox-Crete Products Group; MONOFILM.
  - n. Sika Corporation; SikaFilm.
  - o. SpecChem, LLC; Spec Film.
  - p. Symons by Dayton Superior; Finishing Aid.
  - q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
  - r. Unitex; PRO-FILM.
  - s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
  - C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
  - D. Water: Potable.

## 2.7 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
  - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
  - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
  - 4. Compressive Strength: Not less than [**4000 psi**] at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
  - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
  - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
  - 4. Compressive Strength: Not less than 3000 psi at 28 days when tested according to ASTM C 109/C 109M.

## 2.8 CONCRETE MIXTURES, GENERAL

- 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, according to ACI 301.
  - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.



- B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to **0.06** percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
  - 1. Use water-reducing admixture in concrete, as required, for placement and workability.
  - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
  - 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

## 2.9 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings & walls: Proportion normal-weight concrete mixture as follows:
  - 1. Minimum Compressive Strength: **3000 psi** at 28 days.
  - 2. Maximum Water-Cementitious Materials Ratio: **0.45**.
  - 3. Slump Limit: **4 inches plus** or minus 1 inch.
  - 4. Air Content: **5.5** percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
  - 5. Air Content: **6** percent, plus or minus 1.5 percent at point of delivery for **1-inch** or smaller nominal maximum aggregate size.
- B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:
  - 1. Minimum Compressive Strength: **4000 psi (27.6 MPa)** at 28 days.
  - 2. Minimum Cementitious Materials Content: **470 lb/cu. yd.**
  - 3. Slump Limit: **4 inches plus** or minus 1 inch.
  - 4. Air Content: **[5.5]** percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
  - 5. Air Content: **[6]** percent, plus or minus 1.5 percent at point of delivery for **1-inch or smaller** nominal maximum aggregate size.
  - 6. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

## 2.10 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## 2.11 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.
  - 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

## PART 3 - EXECUTION

### 3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
  - 1. **Class A, 1/8 inch** for smooth-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
  - 1. Install keyways, reglets, recesses, and the like, for easy removal.
  - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Retain one of two options in first paragraph below. ACI 301 requires chamfers unless otherwise specified.
  - I. Exterior corners and edges of permanently exposed concrete.
- J. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- K. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- L. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- M. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.2 REMOVING AND REUSING FORMS

- A. Revise removal time in first paragraph below if required. Period of 24 hours is halved to 12 hours in ACI 347. Commentary in ACI 318 (ACI 318M) recognizes 12 hours for concrete using regular portland cement but advises that this period may be insufficient for concrete using Type II and Type V portland cements or ASTM C 595 blended hydraulic cements, concrete with retarding admixtures, and concrete using ice during mixing.
- B. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.
- C. Retain option in first subparagraph below if adopting recommendation of ACI 347. ACI 301 requires concrete to reach its specified compressive strength.
- D. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- E. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

### 3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
  - 1. Do not cut or puncture vapor retarder. 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 would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
  - 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

### 3.4 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. 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. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
  - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
  - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  - 5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  - 6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

### 3.5 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
  2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
  3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- 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.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  2. Maintain reinforcement in position on chairs during concrete placement.
  3. Screed slab surfaces with a straightedge and strike off to correct elevations.
  4. Slope surfaces uniformly to drains where required.
  5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
  2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
  2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

### 3.6 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces **not exposed to public view**
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces **exposed to public view**

### 3.7 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
  - 1. Apply float finish to surfaces **to receive trowel finish**
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
  - 1. Apply a trowel finish to surfaces **exposed to view to be covered with resilient flooring, carpet, or ceramic tile.**
  - 2. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed **3/16 inch (4.8 mm).**
- D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
  - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect/Engineer before application.

### 3.8 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

### 3.9 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.

- b. Continuous water-fog spray.
  - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
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. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
    - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
    - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
  3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
    - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer [ **unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project**].
  4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### 3.10 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half 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, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, 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. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. 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 will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match

- before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include 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, and other objectionable conditions.
  2. After concrete has cured at least 14 days, correct high areas by grinding.
  3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
  4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
  5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
  6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
  7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. 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/Engineers' approval.

**END OF SECTION 033000**

## SECTION 03 60 00 – ANCHORING CEMENT

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. This section specifies anchoring cement to be used for anchoring posts, dowels, rods, appliances or machinery and elsewhere as indicated.

#### 1.2 RELATED SECTIONS

- A. Section 033000 – Cast in Place Concrete

#### 1.3 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM C-109 – Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50 mm. Cube Specimens).
  - 2. ASTM C-266 – Test Method for Time of Setting of Hydraulic-Cement Paste by Gillmore Needles.
  - 3. ASTM C-1090 – Test Method for Measuring Change in Height of Cylindrical Specifications for Hydraulic-Cement Grout.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 013300 – Submittal Procedures
  - 1. Product Data: Manufacturer's literature to include surface preparation, application instructions, recommendations and storage and handling requirements.
  - 2. Test Data: Confirm compliance and performance with specified requirements.

#### 1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: Applicator must have prior experience applying specified product or similar products or have manufacturer's representative on site ensuring that preparation and application are performed correctly.
- B. Mockup:
  - 1. Architect will select area for mockup.
  - 2. Prior notice will be given to architect four days before mockups will be applied.
  - 3. Architect must approve mockup before final product is applied.
  - 4. At the architect's discretion, approved mockups may become incorporated into the final work.

#### 1.6 DELIVERY, STORAGE & HANDLING

- A. Materials must be delivered in original, unopened containers with the manufacturer's labels including product name and batch numbers.
- B. Store material in a dry area, above ground. Protect cement from moisture and humidity.

#### 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Environmental Conditions: Do not apply material when temperature is below 45°F (7°C) or when temperature is expected to fall below 45°F within 48 hours.



- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
  - 1. US MIX Co.
  - 2. Sakrete.
  - 3. Quickcrete.
  - 4. Sikaflex.

### 2.2 MATERIALS

- A. Anchoring Cement:
  - 1. US SPEC Anchoring Cement
  - 2. Description: Cement based, non-corrosive, non-rusting and 100% waterproof anchoring cement.
- B. Concrete Cleaner:
  - 1. US SPEC Maxi Concrete Cleaner
  - 2. Description: Citrus-based concrete cleaner to clean and strip dirt, grease and laitance from surfaces to receive anchoring cement.
- C. Membrane Forming Curing Compound:
  - 1. US SPEC Maxcure Resin Clear
  - 2. Description: Dissipating hydrocarbon resin curing compound.
  - 3. Compliance: ASTM C-309 Type I, Class B

### 2.3 MATERIAL PROPERTIES

- A. ASTM C-109 – Compressive Strength:
  - 1. 1 Day – 3,000 psi (20.7 MPa) minimum
  - 2. 3 Days – 4,500 psi (31.0 MPa) minimum
  - 3. 7 Days – 5,000 psi (34.4 MPa) minimum
  - 4. 28 Days – 5,500 psi (37.9 MPa) minimum
- B. ASTM C-266 – Rate of Set:
  - 1. Initial Set – 10 minutes minimum
  - 2. Final Set – 15 minutes minimum, 25 minutes maximum
- C. ASTM C-1090 – Height Change:
  - 1. 1 Day – +0.007% minimum, +0.3% maximum
  - 2. 28 Days – +0.016% minimum, +0.3% maximum

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine areas to receive anchoring cement. Notify Engineer if surfaces are unacceptable. Do not begin surface preparation or application until unacceptable conditions are corrected.

### 3.2 SURFACE PREPARATION

- A. Remove all grease, oil, dirt, laitance and unsound concrete. Saturate area to receive anchoring cement with water. Remove any puddles of water before placing grout. Maintain a temperature between 45°F and 90°F (7°C and 32°C) prior to application and during initial 24 hours.

### 3.3 APPLICATION

- A. Mix and place anchoring cement according to manufacturer's instructions.
- B. Prior to anchoring, thoroughly saturate concrete surfaces for 24 hours; remove excess water.
- C. Material may be rodded or tamped; do not vibrate.

### 3.4 CURING

- A. Place wet cloths on all exposed areas of anchoring cement for a minimum of 6 hours.
- B. After 6 hours, remove cloths and apply membrane forming curing compound.

**END OF SECTION 03 60 00**

## SECTION 055200 - METAL FABRICATIONS

### PART 1: GENERAL

SECTION INCLUDES – The following scope of work:

- A. Drawings and applicable requirements of Conditions of the Contract including General and Supplementary and of other Division 1 Specification Sections listed under General Requirements apply to Work of this Section.
- B. Location of Work:
  - 1. Entry Stair and ramp.
- C. Work Included:
  - 1. Provide items fabricated from iron and steel shapes, channels, angles, plates, bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems in other sections of these specifications.
  - 2. Such items shall include, but shall not necessarily be limited to the following (See drawings for required items):
    - a. Exterior Stair Railings/Handrails.
    - b. Railing Anchorage.
  - 3. Provide anchorage of the type to coordinate with the supporting structure and to provide adequate support.
  - 4. Do all cutting, reinforcing, drilling and tapping as required to erect the work and to fit same with work provided under other sections of the specifications.
- D. Related Work Within Other Sections:
  - 1. Concrete: Section 033000.
  - 2. Non-Shrink Grout: Section 036000.

#### 1.1 QUALITY ASSURANCE

- A. Take field measurements prior to preparation of shop drawings and fabrications, where possible. Do not delay job progress; allow for trimming and fitting wherever taking field measurements before fabrication might delay work.
- B. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. References: Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used).
  - American Hot-Dip Galvanizers Assn. (AHDGA)
  - American Iron and Steel Institute (AISI)
  - American Institute of Steel Construction (AISC)
  - American Society for Testing and Materials (ASTM)
  - American Welding Society (AWS)
  - National Association of Architectural Metal Manufacturers (NAAMM)
  - Steel Structures Painting Council (SSPC)

#### 1.2 SUBMITTALS

- A. Submit shop drawings for fabrication and erection of miscellaneous metal fabrications. Include plans, elevations, and details of sections and connections. Show anchorage, hardware, accessory items and relation to adjacent work. Submit samples where factory finished colors are specified.
- B. Certificates:

1. Affidavits and certificates shall be submitted on company letterhead and shall be signed by an officer of the company.

### 1.3 DELIVERY, STORAGE AND HANDLING

#### A. Delivery:

1. Deliver work of this Section to Project Site at such intervals and in such sequence as to insure uninterrupted progress of work.

#### B. Storage:

1. Store materials and work of this Section in an arrangement and manner that will permit easy access for inspection and identification, and that will keep handling to a minimum.
2. Keep work covered, off of ground, using non-corrosive supports. Protect work from mud, corrosion, and deterioration. Protect from accumulation of water.
3. Do not store work on structure in a manner that might cause distortion or damage to members or to supporting structures. Repair or replace damaged work as directed.

## PART 2: PRODUCTS

### 2.1 MATERIALS

#### A. For fabrication of miscellaneous metal work that will be exposed to view, use only materials that are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.

1. Steel Plates, Shapes and Bars; ASTM A36; Sheet Steel: ASTM A446 and Miscellaneous Steel: AISI Mild Steel.
2. Steel Tubing: Hot-formed, welded or seamless, ASTM A500, Grade B.
3. Non-shrink, non-ferrous grout: CE CRD C588 (9000 psi at 28 days). Conform to Section 03600.
4. Hot-dipped galvanizing applied on work of this Section shall comply with requirements of the following:
  - a. ASTM A123 for products fabricated from rolled, pressed, and forged steel shapes, plates, bars and strips and for assembled steel products.

#### B. Galvanized Repair Paint:

1. High zinc dust content paint for re-galvanizing welds and abrasions in galvanized steel, complying with military standard MIL-P-21035 (ships).

### 2.2 FABRICATION

#### A. Use materials of size and thickness shown, or, if not shown, of required size and thickness to produce adequate strength and durability in the finished product for the intended use. Work to the dimensions shown or accepted on Shop Drawings, using proven details of fabrication and support. Joints exposed to weather shall be formed to exclude water.

1. Steel shall be well formed to shape and size, with sharp angles and lines. Shearing and punching shall leave clean, true lines and surfaces. Curved work shall be sprung evenly.

#### B. Wherever dissimilar metals come into contact, insert lead washers, spacers, gaskets or special non-bleeding coating between them to provide electrolytic insulation, subject to Owner's approval.

#### C. Finishes: all railings are to be powder coated and/or match existing finishes of adjacent similar materials.

#### D. Form exposed work true to line and level, with accurate angles and surfaces and straight, sharp smooth edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Form bent metal corners to the smallest radius possible without causing grain separation or otherwise impairing the work.

#### E. Weld corner seams continuously and in accordance with the recommendations of the American Welding Society. Grind exposed welds smooth and flush to match and blend with adjoining surfaces. Grinding shall not produce dips, reduction, or change of profile of member. Use Bondex between structural welds to achieve a uniform appearance (all ground smooth).

- F. Form exposed connections with hairline joints, which are flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of the type shown or, if not shown, use Phillips flat-head (countersunk) screws or bolts.
- G. Provide for anchorage of the type shown, coordinated with ARCHITECT and space anchoring devices to provide adequate support for the intended use of the Work.
- H. Cut, reinforce, drill and tap Metalwork indicated to receive other items, and connections for the work of other trades.
- I. Rough Hardware:
  - 1. Furnish bent or, otherwise, custom-fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting and for anchoring or securing.
  - 2. Manufacture or fabricate items of sizes, shapes and dimensions required. Furnish malleable iron washers for heads and nuts that bear on wood structural connections; elsewhere, furnish steel washers.
- J. Expansion Bolts:
  - 1. Expansion bolts for securing to concrete shall be one of the following: "Parabolt" (Molly Fastener Group of Emhart, Temple, PA 19560); "Wedge Anchors" (ITT Phillips Drill Division, Michigan City, IN 46360); or "Kwik Bolt" (Hilti, Inc., Stamford, CT 06405).
  - 2. Expansion bolts for securing to masonry shall be one of the following: "Parabolt" (Molly Fastener Group of Emhart, Temple, PA 19560); "Sleeve Anchors" (ITT Phillips Drill Division, Michigan City, IN 46360); or "Sleeve Anchors" (Hilti, Inc., Stamford, CT 06405).
  - 3. Bolt materials shall be low carbon steel AISI 1000 Series, meeting chemical requirements of ASTM A108.
  - 4. Nuts shall meet ASTM A307.
  - 5. Bolts shall be of size shown on Drawings or as specified for specific item of work herein. Bolts shall be a minimum of 3/8" diameter. Embedment shall be a minimum of 3" into concrete or masonry.
  - 6. Provide bolts with hex-nuts and washers.
  - 7. At exterior applications, bolts shall be stainless steel or hot-dipped galvanized finish.
  - 8. Expansion bolts for securing vibrating equipment shall be one of the following: "Parabond Capsule Anchors" (Molly Fastener Group of Emhart, Temple, PA 19560); or "Hilti Adhesive Anchor" (Hilti, Inc., Tulsa, OK 74145).

### 2.3 MISCELLANEOUS METAL FABRICATIONS

- A. Steel Tube Railings and Handrails:
  - 1. Nominal 1-1/4" i/d. standard steel pipe handrails, stair railings as indicated on the drawings. Railings shall have rounded, closed ends, welded, and welded joints with all welds ground smooth. Use Bondex between structural welds to achieve a uniform appearance (all ground smooth).
    - b. Secure railings to floor by setting in pipe sleeves set in concrete and using Por-Rok non-shrinking cement (Lehn & Fink Industrial Products, Div. of Sterling Drug, Inc.).

## PART 3: EXECUTION

### 3.1 INSTALLATION

- A. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.
- B. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

- C. Anchor securely as shown or as required for the intended use, using concealed anchors wherever possible.
- D. Cutting, Fitting, and Placement:
  - 1. Perform cutting, drilling and fitting required for the installation of the metal items. Set the work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.
  - 2. Fit exposed connections accurately together to form tight, hairline joints. Weld connections which are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Grind joints smooth.
- E. Field Welding: Comply with AWS Code for the procedures of metal shielded metal-arc welding, the appearance and quality of welds made, and the methods used in correcting welding work.
- F. Railings and Handrails:
  - 1. Adjust railings prior to securing in place to ensure proper matching at abutting joints and correct alignment throughout their length. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:
    - a. Core drill holes not less than 1" greater than the outside diameter of post. Clean holes of all loose material, insert posts, and fill the space between post and concrete with non-shrink, nonferrous grout.
  - 2. All exposed metal work shall have workmanship of a quality to achieve a fine appearance as approved by CONSTRUCTION MANAGER.
- G. Clean and touch-up scarred and abraded shop coats.
  - 1. Use primer required for original work. Repair in accordance with requirements of manufacturer of coating.

**END METAL FABRICATIONS 05 52 00**

## SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

### 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. Framing with dimension lumber.
2. Rooftop equipment bases and support curbs.
3. Wood blocking and nailers.
4. Wood sleepers.
5. Utility shelving.
6. Plywood backing panels.

- B. Related Requirements:

1. Division 06 Section "Sheathing."
2. Division 06 Section "Shop-Fabricated Wood Trusses."
3. Division 06 finish carpentry Sections for nonstructural carpentry items exposed to view and not specified in another Section.

#### 1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NHLA: National Hardwood Lumber Association.
3. NLGA: National Lumber Grades Authority.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
  2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
  3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
  4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
  5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
1. Preservative-treated wood.
  2. Fire-retardant-treated wood.
  3. Power-driven fasteners.
  4. Powder-actuated fasteners.
  5. Expansion anchors.
  6. Metal framing anchors.

#### 1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.



## PART 2 - PRODUCTS

### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency. In DOC PS 20, dressed sizes of green lumber are larger than dry lumber.
  - 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
  - 3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

### 2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
  - 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
  - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  - 2. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.
  - 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
  - 4. Wood floor plates that are installed over concrete slabs-on-grade.

## 2.3 DIMENSION LUMBER FRAMING

### A. Other Framing: No. 2 grade and any of the following species:

1. Hem-fir (north); NLGA.
2. Southern pine; SPIB.
3. Douglas fir-larch; WCLIB or WWPA.
4. Mixed southern pine; SPIB.
5. Spruce-pine-fir; NLGA.
6. Douglas fir-south; WWPA.
7. Hem-fir; WCLIB or WWPA.
8. Douglas fir-larch (north); NLGA.
9. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

## 2.4 MISCELLANEOUS LUMBER

### A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.
6. Grounds.
7. Utility shelving.

### B. For items of dimension lumber size, provide Construction or No. 2:.

1. Hem-fir (north); NLGA.
2. Mixed southern pine; SPIB.
3. Spruce-pine-fir; NLGA.
4. Hem-fir; WCLIB or WWPA.
5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
6. Western woods; WCLIB or WWPA.
7. Northern species; NLGA.
8. Eastern softwoods; NeLMA.

### C. For concealed boards, provide lumber with 19 percent maximum moisture content and **[any of]** the following species and grades:

1. Mixed southern pine, No. 2 grade; SPIB.

### D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

## 2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: DOC PS 1, Exterior, AC in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.
  - 1. Plywood shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## 2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.
- F. Lag Bolts: **ASME B18.2.1.**
- G. Bolts: Steel bolts complying with **ASTM A 307, Grade A**; with **ASTM A 563** hex nuts and, where indicated, flat washers.
- H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
  - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
  - 2. Material: Stainless steel with bolts and nuts complying with **ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.**

## 2.7 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - 1. Cleveland Steel Specialty Co.
  - 2. KC Metals Products, Inc.
  - 3. Phoenix Metal Products, Inc.
  - 4. Simpson Strong-Tie Co., Inc.
  - 5. USP Structural Connectors.
- C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, **G60** coating designation.
  - 1. Use for interior locations unless otherwise indicated.
- D. Hot-Dip Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); **G185** coating designation; and not less than **0.036 inch** thick.
  - 1. Use for wood-preservative-treated lumber and where indicated.
- E. Stainless-Steel Sheet: ASTM A 666, Type 304.
  - 1. Use for exterior locations and where indicated.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.
- E. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

- F. Do not splice structural members between supports unless otherwise indicated.
- G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
  - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than **16 inches** O.C.
- H. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- I. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- J. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. NES NER-272 for power-driven fasteners.
  - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
  - 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
- K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

### 3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than **1-1/2 inches** wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

### 3.3 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

**END OF SECTION 06 10 53**

END OF SECTION 061053

## SECTION 061600 - SHEATHING

### 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. Wall sheathing.
  - 2. Roof sheathing.
- B. Related Requirements:
  - 1. Division 06 Section "Miscellaneous Rough Carpentry" for plywood backing panels.
  - 2. Division 07 Section "Weather Barriers" for water-resistive barrier applied over wall sheathing.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
  - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
  - 3. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5516.
  - 4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
  - 5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

## 1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

## PART 2 - PRODUCTS

### 2.1 WOOD PANEL PRODUCTS

- A. Emissions: Products shall meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Plywood: DOC PS 1 unless otherwise indicated.
- C. All sheathing products to be APA-rated.
- D. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- E. Factory mark panels to indicate compliance with applicable standard.

### 2.2 ROOF SHEATHING

- A. Plywood Roof Sheathing: Exterior, Structural Exposure 1 sheathing.
  - 1. Span Rating: Not less than 48/24.
  - 2. Nominal Thickness: Not less than 5/8 inch.

### 2.3 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. For roof **[and wall]** sheathing, provide fasteners **[with hot-dip zinc coating complying with ASTM A 153/A 153M] [of Type 304 stainless steel]**.



- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
  - 1. For wall and roof sheathing panels, provide screws with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

## 2.4 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.
  - 1. Adhesives shall have a VOC content of **50 g/L** or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
  - 1. NES NER-272 for power-driven fasteners.
  - 2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
  - 3. Table R602.3 (1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's "International Residential Code for One- and Two-Family Dwellings."

- D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

**END OF SECTION 06 16 00**

## SECTION 061753 - SHOP-FABRICATED WOOD TRUSSES

### 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. Wood roof trusses.
2. Wood girder trusses.
3. Wood truss bracing.
4. Wood truss accessories.

- B. Related Requirements:

1. Division 06 Section "Sheathing" for roof sheathing and subflooring.

#### 1.3 DEFINITIONS

- A. Metal-Plate-Connected Wood Trusses: Planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For metal-plate connectors, metal truss accessories, and fasteners.

- B. Shop Drawings: Show fabrication and installation details for trusses.

1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
2. Indicate sizes, stress grades, and species of lumber.
3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
4. Indicate locations, sizes, and materials for permanent bracing required to prevent buckling of individual truss members due to design loads.
5. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
6. Show splice and bearing details.

- C. Delegated-Design Submittal: For metal-plate-connected wood trusses indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For metal connector-plate manufacturer, professional engineer and fabricator.
- B. Material Certificates: For dimension lumber specified to comply with minimum specific gravity. Indicate species and grade selected for each use and specific gravity.
- C. Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss fabricating firm.
- D. Evaluation Reports: For the following, from ICC-ES:
  - 1. Wood-preservative-treated lumber.
  - 2. Fire-retardant-treated wood.
  - 3. Metal-plate connectors.
  - 4. Metal truss accessories.

#### 1.6 QUALITY ASSURANCE

- A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.
  - 1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
  - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that complies with quality-control procedures in TPI 1 and that involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.
- C. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Handle and store trusses to comply with recommendations in TPI BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."
  - 1. Store trusses flat, off of ground, and adequately supported to prevent lateral bending.
  - 2. Protect trusses from weather by covering with waterproof sheeting, securely anchored.
  - 3. Provide for air circulation around stacks and under coverings.
- B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 Section "Quality Requirements," to design metal-plate-connected wood trusses.
- B. Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.
  - 1. Design Loads: As indicated.
  - 2. Maximum Deflection Under Design Loads:
    - a. Roof Trusses: Vertical deflection of 1/240 of span.
- C. Comply with applicable requirements and recommendations of the following publications:
  - 1. TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction."
  - 2. TPI DSB, "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."
  - 3. TPI BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."
- D. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."
- E. Wood products are to be FSC-certified. Provide documentation as indicated in submittals.

### 2.2 DIMENSION LUMBER

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency

certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Provide dressed lumber, S4S.
4. Provide dry lumber with [19] [15] percent maximum moisture content at time of dressing.

B. Minimum Chord Size for Roof Trusses: 2 by 6 inches nominal for top chords.

C. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Division 06 Section "Miscellaneous Rough Carpentry"

### 2.3 METAL CONNECTOR PLATES

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Alpine Engineered Products, Inc.; an ITW company.
2. Cherokee Metal Products, Inc.; Masengill Machinery Company.
3. CompuTrus, Inc.
4. Eagle Metal Products.
5. Jager Building Systems, Inc.; a Tembec/SGF Rexfor company.
6. MiTek Industries, Inc.; a subsidiary of Berkshire Hathaway Inc.
7. Robbins Engineering, Inc.
8. Truswal Systems Corporation; an ITW company.

B. Source Limitations: Obtain metal connector plates from single manufacturer.

C. General: Fabricate connector plates to comply with TPI 1.

D. Hot-Dip Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 coating designation; and not less than 0.036 inch thick.

1. Use for interior locations unless otherwise indicated.

### 2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.

B. Nails, Brads, and Staples: ASTM F 1667.

## 2.5 METAL FRAMING ANCHORS AND ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following:
  - 1. Cleveland Steel Specialty Co.
  - 2. KC Metals Products, Inc.
  - 3. Phoenix Metal Products, Inc.
  - 4. Simpson Strong-Tie Co., Inc.
  - 5. USP Structural Connectors.
- C. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer that meet or exceed those **indicated**. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- D. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, **G60** coating designation.
  - 1. Use for interior locations unless otherwise indicated.
- E. Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); **G185** coating designation; and not less than **0.036 inch** thick.
  - 1. Use for wood-preserved-treated lumber and where indicated.
- F. Truss Tie-Downs: Bent strap tie for fastening roof trusses to wall studs below, **1-1/2 inches** wide by **0.050 inch** thick. Tie fastens to one side of truss, top plates, and side of stud below.
- G. Roof Truss Clips: Angle clips for bracing bottom chord of roof trusses at non-load-bearing walls, **1-1/4 inches** wide by **0.050 inch** thick. Clip is fastened to truss through slotted holes to allow for truss deflection.
- H. Roof Truss Bracing/Spacers: U-shaped channels, **1-1/2 inches** wide by **1 inch** deep by **0.040 inch** thick, made to fit between two adjacent trusses and accurately space them apart, and with tabs having metal teeth for fastening to trusses.

## 2.6 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20, with dry film containing a minimum of 94 percent zinc dust by weight.

## 2.7 FABRICATION

- A. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.

- B. Fabricate metal connector plates to sizes, configurations, thicknesses, and anchorage details required to withstand design loads for types of joint designs indicated.
- C. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.
  - 1. Fabricate wood trusses within manufacturing tolerances in TPI 1.
- D. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install wood trusses only after supporting construction is in place and is braced and secured.
- B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.
- C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
- D. Install and brace trusses according to TPI recommendations and as indicated.
- E. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
- F. Space trusses as indicated; adjust and align trusses in location before permanently fastening.
- G. Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in metal framing anchors according to manufacturer's fastening schedules and written instructions.
- H. Securely connect each truss ply required for forming built-up girder trusses.
  - 1. Anchor trusses to girder trusses as indicated.
- I. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
  - 1. Install bracing to comply with Division 06 Section "Miscellaneous Rough Carpentry."
- J. Install wood trusses within installation tolerances in TPI 1.
- K. Do not alter trusses in field. Do not cut, drill, notch, or remove truss members.



- L. Replace wood trusses that are damaged or do not meet requirements.
  - 1. Damaged trusses may be repaired according to truss repair details signed and sealed by the qualified professional engineer responsible for truss design, when approved by Architect.

3.2 REPAIRS AND PROTECTION

- A. Protect wood trusses from weather.
- B. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

**END OF SECTION 06 17 53**

ND OF SECTION 061753

## SECTION 062000 – FINISH CARPENTRY

### PART 1 GENERAL

#### 1.1 SECTION – Scope of work includes but is not necessarily limited to the following:

- A. Interior trim:
  - 1. Window/door trim.
  - 2. Decorative wood trim.
- B. Exterior trim:
  - 1. Window/door casing.
  - 2. Soffit & fascia.
  - 3. Cornerboards.
  - 4. Decorative trim.

#### 1.2 WORK NOT INCLUDED

- A. Submittals
- B. Verify the location and positioning with the architect prior to installing.

#### 1.4 QUALITY ASSURANCE

- A. Perform work in accordance with AWI "Custom" quality.
- B. Shop-fabricate finish carpentry work to the extent feasible and where shop fabrication will result in better workmanship than feasible for on-site fabrication.
- C. Product Handling: Keep materials dry during delivery and storage. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood to provide air circulation within stacks.

#### 1.5 JOB CONDITIONS

- A. Maintain building ambient temperatures at or above 55E for 48 hours before installation and continuously thereafter.

### PART 2 PRODUCTS

#### 2.1 LUMBER MATERIALS

- A. Hardwood Lumber: Graded in accordance with AWI Custom; Red Oak, quarter sawn, maximum moisture content of 6 percent; with grain, of quality suitable for transparent finish.
- B. WWPA standard shapes and sizes as follows (where wood trim is called out):
  - 1. Match existing (all areas of work).

#### 2.2 SHEET MATERIALS

- A. Hardwood Plywood: HPVA HP-1 Grade A Type Red Oak; Graded in accordance with AWI veneer, type of glue recommended for application; Red Oak face species, Rotary cut.

### 2.3 ACCESSORIES

- A. Fasteners: Size and type to suit application; Hot dipped galvanized steel for exterior, high humidity and treated wood locations, plain finish elsewhere.
- B. Bolts, Nuts, Washers, Blind Fasteners, Lags, and Screws: Size and type to suit application; galvanized steel for exterior, high humidity and treated wood locations, plain finish elsewhere.
- C. Contact Adhesives: Water Base type.

## PART 3 EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Prime paint surfaces of all items or assemblies prior installation.
- B. Condition materials to humidity conditions in installation areas.
- C. Match all existing shapes and sizes of existing material.
- C. Discard materials which are warped, bowed, twisted, or have defects with respect to surfaces, sizes or patterns, or are not of the length required to fabricate the work with minimum joints.

### 3.2 INSTALLATION

- A. Install work in accordance with AWI Quality Standard.
- B. Set and secure materials and components in place, plumb and level.
- C. Scribe and cut work to fit adjoining surfaces. Refinish or repair damaged finish at cuts.
- D. Install with minimum number of joints using materials cut from maxi-mum lengths available. Stagger joints in adjacent and related members. Cope returns, miter corners, use scarf joints for end-to-end joints.
- E. Cover exposed edges of shelving with 3/8 inch (10 mm) thick hardwood edging.
- F. Apply plastic laminate finishes with adhesive over entire surface.

**END OF SECTION 062000**

## SECTION 072100 - THERMAL INSULATION

### 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. Foam-plastic board insulation.
2. Spray polyurethane foam insulation.
3. Fiberglass batt insulation.
4. Vapor retarders.

- B. Related Sections:

1. Division 06 Section "Sheathing" for foam-plastic board sheathing over wood or steel framing.
2. Division 09 Section(s) "Gypsum Board Wall Assemblies" for installation in metal-framed assemblies of insulation specified by referencing this Section.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.
- C. Research/Evaluation Reports: For foam-plastic insulation, from ICC-ES.

#### 1.4 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
  - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
  - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.
  - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

## PART 2 - PRODUCTS

### 2.1 FOAM-PLASTIC BOARD INSULATION

- A. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and minimum compressive strength indicated below, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. DiversiFoam Products.
    - b. Dow Chemical Company (The).
    - c. Owens Corning.
    - d. Pactiv Building Products.
  - 2. Type X, 15 psi.
- B. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

### 2.2 SPRAY POLYURETHANE FOAM INSULATION

- A. Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. BASF Corporation.
    - b. BaySystems NorthAmerica, LLC.
    - c. Dow Chemical Company (The).

- d. ERSystems, Inc.
  - e. Gaco Western Inc.
  - f. Henry Company.
  - g. NCFI; Division of Barnhardt Mfg. Co.
  - h. SWD Urethane Company.
  - i. Volatile Free, Inc.
2. Minimum density of **1.5 lb/cu. ft.**, thermal resistivity of **6.2 deg F x h x sq. ft./Btu x in. at 75 deg F.**
- B. Open-Cell Polyurethane Foam Insulation: Spray-applied polyurethane foam using water as a blowing agent, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
- 1. Manufacturers: Subject to compliance with requirements, **[provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
    - a. BaySystems NorthAmerica, LLC.
    - b. Demilec (USA) LLC.
    - c. Gaco Western Inc.
    - d. Icynene Inc.
    - e. SWD Urethane Company.
  - 2. Minimum density of **0.4 lb/cu. ft.**, thermal resistivity of **3.4 deg F x h x sq. ft./Btu x in. at 75 deg F.**

## 2.3 BATT INSULATION

- A. Mineral Fiber Insulation: ASTM C 665, Type I.
- 1. Manufacturers: Subject to compliance with requirements, **[provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
    - a. Roxul.
    - b. Or approved other.

## 2.4 VAPOR RETARDERS

- A. Polyethylene Vapor Retarders: ASTM D 4397, **6 mils** thick, with maximum permeance rating of **0.13 perm.**
- B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
- C. Vapor-Retarder Fasteners: Pancake-head, self-tapping steel drill screws; with fender washers.

- D. Single-Component Nonsag Urethane Sealant: ASTM C 920, Type I, Grade NS, Class 25, Use NT related to exposure, and Use O related to vapor-barrier-related substrates.
- E. Adhesive for Vapor Retarders: Product recommended by vapor-retarder manufacturer and has demonstrated capability to bond vapor retarders securely to substrates indicated.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation or that interfere with insulation attachment.

### 3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

### 3.3 INSTALLATION OF BELOW-GRADE INSULATION

- A. On vertical footing and foundation wall surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.

### 3.4 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Spray-Applied Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.

- C. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
  - 1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

### 3.5 INSTALLATION OF VAPOR RETARDERS

- A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.
  - 1. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners **16 inches** o.c.
  - 2. Before installing vapor retarders, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
  - 3. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.
- C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

### 3.6 PROTECTION

- A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

### 3.7 INSULATION SCHEDULE

- A. Insulation Type Foundation: extruded-polystyrene board insulation.
- B. Insulation Type Exterior walls: Polyurethane spray foam insulation.

**END OF SECTION 07 21 00**

END OF SECTION 072100



## SECTION 07 31 13 ASPHALT SHINGLES

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Removal of existing roofing.
- B. Ventilated roof insulation panels.
- C. Asphalt roofing shingles.
- D. Leak barrier and moisture shedding roof deck protection.
- E. Underlayment.
- F. Metal flashing associated with shingle roofing.
- G. Attic ventilation and ventilation accessories.

#### 1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry.
- B. Section 07620 - Sheet Metal Flashing and Trim.

#### 1.3 REFERENCES

- A. AC438-1011-R1 - New Acceptance Criteria for Alternative Asphalt Roofing Shingles
- B. American Society of Civil Engineers (ASCE): ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. Asphalt Roofing Manufacturers Association (ARMA).
- D. ASTM International (ASTM):
  - 1. ASTM D 3018 - Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.
  - 2. ASTM D 3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).
  - 3. ASTM D 3462 - Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.
  - 4. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 5. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  - 6. ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction.
  - 7. ASTM C 1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
  - 8. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
  - 9. ASTM E 903 - Standard Test Method for Solar Absorption, Reflectance and Transmission of Materials Using Integrating Spheres.
- E. California Title 24 Energy Efficient Standards.
- F. Cool Roof Rating Council (CRRC).
- G. ENERGYSTAR.
- H. National Roofing Contractors Association (NRCA).
- I. Sheet Metal and Air Conditioning Contractors National Association, 1nc. (SMACNA) - Architectural Sheet Metal Manual.
- J. Underwriters Laboratory (UL)
  - 1. UL 790 - Tests for Fire Resistance of Roof Covering Materials.

## 2. UL 997 - Wind Resistance of Prepared Roof Covering Materials.

### 1.4 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of roofing terms related to this section.

### 1.5 SUBMITTALS

- A. Submit under provisions of Section 01300 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, showing compliance with requirements.
- C. Installation Instructions: Manufacturer's installation instructions, showing required preparation and installation procedures.
- D. LEED Submittals: Submit documentation indicating solar reflective index, and location for regional materials credit as applicable.

### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide all primary roofing products, including shingles, underlayment, leak barrier, and ventilation, by a single manufacturer.
- B. Installer Qualifications: Installer must be approved by manufacturer for installation of all roofing products to be installed under this section.
- C. USGBC LEED: Provide products meeting solar reflective index required to achieve LEED Credit for Roof Heat Island Effect.

### 1.7 REGULATORY REQUIREMENTS

- A. Provide a roofing system achieving an Underwriters Laboratories (UL) Class A fire classification.
- B. Provide a roofing system achieving an ENERGYSTAR rating.
- C. Install all roofing products in accordance with all federal, state and local building codes.
- D. All work shall be performed in a manner consistent with current OSHA guidelines.

### 1.8 PRE-INSTALLATION MEETINGS

- A. Convene a pre-installation meeting a minimum two weeks prior to starting work of this section.
  - 1. Contractor shall schedule and arrange meeting and meeting place and notify attendees.
  - 2. Mandatory Attendees: Roofing installer and manufacturer's steep slope technical representative (not sales agent).
  - 3. Optional Attendees: Owner's representative, Architect's representative, prime Contractor's representative.
  - 4. Review all pertinent requirements for achieving the warranty specified below and set schedule for final warranty inspection.

### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened labeled packaging until ready for installation.
- B. Store products in a covered, ventilated area, at temperature not more than 110 degrees F (43 degrees C); do not store near steam pipes, radiators, or in sunlight.
- C. Store bundles on flat surface to maximum height recommended by manufacturer; store rolls on end.

- D. Store and dispose of solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### 1.10 WEATHER CONDITIONS

- A. Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with roofing shingle manufacturer's recommendations.

#### 1.11 WARRANTY

- A. Provide manufacturer's standard limited warranty:
  1. Provide to the Owner a GAF Shingle & Accessory Ltd. Warranty.
  2. Provide to the Owner a GAF WeatherStopper Golden Pledge Ltd Warranty.
  3. Provide to the Owner a GAF WeatherStopper Silver Pledge Ltd Warranty.
  4. Provide to the Owner a GAF Weather Stopper System Plus Ltd Warranty.
  5. Provide to the Owner a GAF All American Pledge Guarantee.
  6. Provide to the Owner a GAF Cornell ThermaCal Nail Base Roof Insulation Ltd. Warranty.
    - a. Warranty Duration: 15 years.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
  1. GAF.
  2. Owens Corning.
  3. IKO.
  4. Or approved other.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600 - Product Requirements.

#### 2.2 SHINGLES (Owner to select manufacturer/model)

- A. Glenwood Lifetime Designer Shingles, by GAF:
  1. Triple layer granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  2. Ultra-dimensional and bold profile provide a bold unique appearance with a 4.5in. exposure.
  3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; Passes UL 2218, Class 4 Impact Test ; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved.
- B. Camelot Lifetime Designer Shingles, by GAF:
  1. Granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  2. Extra thick tabs and bold profile provide a bold unique appearance with a 7.5in. exposure.
  3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98;

Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.

- C. Grand Sequoia Lifetime Designer Shingles, by GAF:
  - 1. Granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and mineral granule surfacing.
  - 2. Special cut tabs and bold profile provide a rugged hand-split shake appearance with an 8 in. exposure.
  - 3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.
- D. Grand Canyon Lifetime Designer Shingles, by GAF:
  - 1. Granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  - 2. Special cut tabs and bold profile provide a rugged hand-split shake appearance with an 8in. exposure.
  - 3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.
- E. Grand Sequoia ArmorShield Lifetime Designer Shingles, by GAF:
  - 1. UL 2218, Class 4, granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and mineral granule surfacing.
  - 2. Special cut tabs and bold profile provide a rugged hand-split shake appearance with an 8 in. exposure.
  - 3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; Passes UL 2218, Class 4 Impact Test ; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.
- F. Monaco Lifetime Designer Shingles by GAF:
  - 1. Granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  - 2. Special cut tabs give the appearance of clay barrel roof tiles.
  - 3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.
- G. Woodland Lifetime Designer Shingles by GAF:
  - 1. Granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  - 2. Special cut tabs give the appearance of staggered slate.
  - 3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.

- H. Sienna Lifetime Designer Shingles by GAF:
  1. Granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  2. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant CSA 123.5-98; Florida Building Code Approved,; Texas Dept of Insurance Approved.
- I. Slateline Lifetime Designer Shingles, by GAF:
  1. Granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  2. Dovetail cut tabs and bold shadow lines provide a slate appearance with a 7 1/2 in. exposure.
  3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.
- J. Camelot II Lifetime Designer Shingles, by GAF:
  1. Granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  2. Thick tabs and bold profile provide a bold unique appearance with a 7.5 in. exposure.
  3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Class F, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98, Texas Dept of Insurance Approved, ICC Report Pending,
- K. Timberline Ultra HD Lifetime High Definition Shingles, by GAF:
  1. Granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  2. Architectural laminate styling provides a wood shake appearance with a 5 5/8 in. exposure. Features GAF's patented High Definition color blends and enhanced shadow effect. .
  3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.
- L. Timberline HD Lifetime High Definition Shingles, by GAF:
  1. Self sealing, granule surfaced, asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  2. Architectural laminate styling provides a wood shake appearance with a 5 5/8in. exposure. Features GAF's patented High Definition color blends and enhanced shadow effect.
  3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.
- M. Timberline Natural Shadow Lifetime Shingles, by GAF:

1. Self sealing, granule surfaced, asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  2. Architectural laminate styling provides a wood shake appearance with 5 5/8in. exposure. Features the classic Natural Shadow effect.
  3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.
- N. Timberline ArmorShield II Shingles, by GAF:
1. UL 2218, Class 4, granule surfaced self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  2. Architectural laminate styling provides a wood shake appearance with a 5 5/8in. exposure.
  3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; Passes UL 2218, Class 4 Impact Test; ASTM D 3462; AC438 compliant; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.
- O. Timberline Cool Series Lifetime Shingles, by GAF:
1. Granule surfaced, high reflectance, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and a mineral granule surfacing.
  2. Architectural laminate styling provides a wood shake appearance with a 5 5/8in. exposure. Features highly reflective roofing granules that bounce back the sun's rays and more effectively release absorbed heat.
  3. Rated by the Cool Roof Rating Council (CRRC), Title 24 compliant and meets initial Energy Star performance levels.
  4. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.
- P. Marquis Weathermax Shingles, by GAF:
1. Granule surfaced self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and a mineral granule surfacing.
  2. Traditional 3-tab styling with a 5 in. or 5 5/8 in. exposure.
  3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98.
- Q. Royal Sovereign Shingles, by GAF:
1. Granule surfaced self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
  2. Traditional 3-tab styling with a 5 in. or 5 5/8 in. exposure.
  3. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.

### 2.3 HIP AND RIDGE SHINGLES

- A. High profile self-sealing hip and ridge cap shingle matching the color of selected roof shingle. Each bundle covers approx. 20 lineal feet (6.10m). Timbertex Premium Ridge Cap Shingles, by GAF.
- B. Distinctive self-sealing hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 31 lineal feet (9.45m) with an 8-inch (203mm) exposure. Ridglass 10in. Ridge Cap Shingles by GAF.
- C. Distinctive self-sealing hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 31 lineal feet (9.45m) with an 8-inch (203mm) exposure Ridglass 8in. Ridge Cap Shingles by GAF.
- D. Distinctive self-sealing hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 25 lineal feet (7.62mm) with a 6 2/3-inch (169mm) exposure. Seal-A-Ridge Ridge Cap Shingles by GAF.
- E. Distinctive hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 33.3 lineal feet (10.15m) with a 5 5/8-inch (147mm) exposure. Z Ridge Shingles by GAF.
- F. Distinctive impact resistant self-sealing hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 25 lineal feet (7.62m) with a 6 2/3-inch (169mm) exposure. Seal-A-Ridge ArmorShield Ridge Cap Shingles by GAF.
- G. Ridge cap shingle field fabricated from the same color and type of field shingle. Each bundle covers approx. 33 lineal feet (10.15m).

### 2.4 STARTER STRIPS

- A. Self-sealing starter shingle designed for all roof shingles. Each bundle covers approx. 120 lineal feet (36.58m). ProStart Starter Strip by GAF.
- B. Self-sealing starter shingle designed for premium roof shingles. Each bundle covers approx. 100 lineal feet (30.48m) for English and metric shingles or 50 lineal feet (15.24m) for oversized shingles. WeatherBlocker Eave/Rake Starter Strip by GAF
- C. Pre-cut, color coordinated starter strip shingle designed as a second starter course for shingles with large cut-outs. Each bundle covers approx. 60 lineal feet (18.29 m) StarterMatch Starter Strip by GAF.

### 2.5 LEAK BARRIER

- A. Self-adhering, self-sealing, bituminous leak barrier surfaced with a smooth polyethylene film. Approved by UL.
  - 1. StormGuard Leak Barrier, by GAF.
  - 2. Grace Ice & Water Shield.
  - 3. Or approved other.

### 2.6 UNDERLAYMENT

- A. #15 Roofing Underlayment: Water repellent breather type cellulose fiber building paper. Meets or exceeds the requirements of ASTM D 4869 Type I.

### 2.7 ROOFING CEMENT

- A. Asphalt Plastic Roofing Cement meeting the requirements of ASTM D 4586, Type I or II.

### 2.8 ROOF ACCESSORIES

- A. Paint: Exterior acrylic rust resistant aerosol roof accessory paint. Each 6 oz can is available

in boxes of 6 and in color to compliment the roof. Shingle-Match Roof Accessory Paint by GAF.

- B. Compression Collars: UV stable solid molded PVC compression collar, Kynar PVDF coated 24-gauge galvanized flange, Ultimate Pipe Flashing by Lifetime Tool.

## 2.9 ATTIC VENTILATION

### A. Ridge Vents:

1. Flexible rigid plastic ridge ventilator designed to allow the passage of hot air from attics, while resisting snow infiltration. For use in conjunction with eave/soffit ventilation products. Provides 12.5 sq inches NFVA per lineal foot (26460 sq.mm/m). Each package contains 20 lineal feet (6.10m) of vent. Cobra Ridge Runner Ridge Vent by GAF.

### B. Hip Vents:

1. Rigid plastic hip ventilator designed to allow the passage of hot air out of attics through the hips. For use in conjunction with eave/ soffit intake ventilation products. Provides 9.0 sq inches (11613 sq.mm/m) in NFVA per lineal foot. Each package contains 40 lineal feet (12.19m) of vent, Cobra Hip Vent Exhaust Vent (includes 1-3/4" (44.5 mm) coil nails), by GAF

### C. Fascia and Soffit/Under Eave Vents:

1. Flexible rigid plastic ridge ventilator designed to allow the passage of hot air out of attics at the roof top along the eaves. For use in conjunction with ridge ventilation products. Provides 9.0 sq inches (11613 sq.mm/m) in NFVA per lineal foot. Each package contains 40 lineal feet (12.19m) of vent, Cobra IntakePro Rooftop Intake Vent (includes 1-3/4" (44.5 mm) coil nails), by GAF
2. Flexible ridge ventilator designed to allow the passage of air into thru the fascia. 1"x3" (25 mm x 76mm) provides a NFVA of 11 square inches per foot and 1 1/2" x3" (38 mm x 76 mm) provides a NFVA of 16 square inches per foot. Cobra Fascia Vent, by GAF.
3. Surface mounted closeable soffit vent with integral screen to help prevent wildfire embers from being drawn into the attic. 16.5" x 9" (419 mm x 229 mm) paintable finish providing 56 sq. in. (36,131 sq mm) of NFA, MasterFlow EmberShield Closeable Soffit Vent by GAF
4. Surface mounted, screened aluminum, corrosion resistant soffit vent. MasterFlow EAC Soffit Vent by GAF.
5. Surface mounted, high impact resin, oval snap-in designed soffit vent. MasterFlow EAP Soffit Vent by GAF.
6. Continuous aluminum 8ft section soffit vent. MasterFlow LSV8 Series Soffit Vent by GAF.

## 2.10 NAILS

- A. Nails: Standard round wire, zinc-coated steel or aluminum; 10 to 12 gauge, smooth, barbed or deformed shank, with heads 3/8 inch (9mm) to 7/16 inch (11mm) in diameter. Length must be sufficient to penetrate into solid wood at least 3/4 inch (19mm) or through plywood or oriented strand board by at least 1/8 inch (3.18mm).

## 2.11 METAL FLASHING

- A. Galvanized Steel: 24 gauge hot-dip galvanized steel sheet, complying with ASTM A 653/A 653M, G90/Z275.
- B. Copper: 16-oz/sq ft (0.56mm) copper sheet, complying with ASTM B 370.



- C. Aluminum: 0.032-inch (0.8mm) aluminum sheet, complying with ASTM B 209.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until roof deck has been properly prepared.
- B. If roof deck preparation is the responsibility of another installer, notify Architect or building owner of unsatisfactory preparation before proceeding.

### 3.2 REMOVAL OF EXISTING ROOFING

- A. Remove all existing roofing down to the roof deck.
- B. Verify that deck is dry, sound, clean and smooth, free of depressions, waves and projections.
- C. Cover with sheet metal all holes over 1-inch (25 mm) diameter, cracks over 1/2 inch (12 mm) in width, loose knots and excessively resinous areas.
- D. Replace damaged deck with new materials.
- E. Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

### 3.3 PREPARATION OF SUBSTRATE

- A. Clean deck surfaces thoroughly prior to installation of leak barrier and roof deck protection.
- B. At areas to receive leak barrier, fill knot holes and cracks with latex filler.
- C. Chimneys: Install crickets on the upslope side of any chimney located in the north, on a roof steeper than 6:12, or wider than 24 inches (610 mm).

### 3.4 INSTALLATION OF UNDERLAYMENT

- A. Install using methods recommended by manufacturer in accordance with local building code. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.
- B. Eaves:
  - 1. Place eave edge metal flashing tight with fascia boards; lap joints 2 inches (50 mm) and seal with plastic cement; nail at top of flange.
  - 2. On roofs with slope between 2:12 and 4:12, and on all roofs in the north, install leak barrier up the slope from eave edge to 36 inches from the edge or at least 24 inches (610 mm) beyond the interior face of the warm exterior wall, whichever is greater; lap ends 6 inches (150 mm) and bond.
- C. Valleys:
  - 1. Install leak barrier at least 36 inches wide centered on valley; lap ends 6 inches (150 mm) and seal.
  - 2. Where valleys are indicated to be "open valleys", install metal flashing over leak barrier before roof deck protection is installed; DO NOT NAIL THROUGH metal flashing; secure by nailing at 18 inches (457 mm) on center just beyond edge of flashing so that nail heads hold down edge.
- D. Hips and Ridges:
  - 1. Install GAF leak barrier along entire lengths. If ridge vents are to be installed, position the GAF leak barrier so that the ridge slots will not be covered.
- E. Roof Deck:
  - 1. Install one layer of roof deck protection over entire area not protected by eave or valley

membrane; run sheets horizontally lapped so water sheds; nail in place.

2. On roofs sloped at more than 4 in 12, lap horizontal edges at least 2 inches (50 mm) and at least 2 inches (50 mm) over eave protection membrane.
  3. On roofs sloped between 2 in 12 and 4 in 12, lap horizontal edges at least 19 inches (480 mm) and at least 19 inches (485 mm) over eave protection membrane.
  4. Lap ends at least 4 inches (100 mm); stagger end laps of each layer at least 36 inches (915 mm).
  5. Lap roof deck protection over valley protection at least 6 inches (152 mm).
- F. Deck-Armor Application
1. Deck-Armor shall be installed over a clean, dry deck.
  2. Install Weather Watch or StormGuard Leak Barrier at eaves, valleys, rakes, skylights, dormers and other vulnerable leak areas.
  3. Lay Deck-Armor over deck and overlap 3in. (76mm) at side laps and 6in. (152mm) at end laps.
  4. For exposure to rain or snow, overlap 12in. (305mm) at end laps.
  5. For side and end laps: fasten Deck-Armor 12in. (305mm) o.c. (6in. (152mm) o.c. for high wind areas).
  6. For middle of the roll: fasten Deck-Armor 24in. (610mm) o.c. (12in. (305mm) o.c. for high wind areas).
  7. For exposure to rain or snow, completely cover all side laps, end laps and fasteners with tape.
  8. For long term exposure see complete Deck-Armor installation instructions for side lap detail.
  9. If roof may be exposed to high winds, apply tape over all fasteners at the center of the roll to prevent rain or snow from entering at the fasteners.
- G. Penetrations:
1. At vent pipes, install a 24 inch (610 mm) square piece of leak barrier lapping over roof deck protection; seal tightly to pipe.
  2. At vertical walls, install leak barrier extending at least 6 inches (150 mm) up the wall and 12 inches (305 mm) on to the roof surface lapping over roof deck protection.
  3. At skylights and roof hatches, install leak barrier up the sides of the frame and 12 inches (305 mm) on to the roof surface on all sides, lapping over roof deck protection.
  4. At chimneys, install leak barrier around entire chimney extending at least 6 inches (152 mm) up the wall and 12 inches (305 mm) on to the roof surface lapping over roof deck protection.
  5. At rake edges, install metal edge flashing over leak barrier and roof deck protection; set tight to rake boards; lap joints at least 2 inches (50 mm) and seal with plastic cement; secure with nails.
  6. At hips and ridges, install leak barrier along entire lengths. If ridge vents are to be installed, position the leak barrier so that the ridge slots are not covered.

### 3.5 INSTALLATION OF SHINGLES

- A. Install in accordance with manufacturer's instructions and requirements of local building code.
1. Avoid breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40 degrees F (4 degrees C).
  2. Handle carefully in hot weather to avoid damaging shingle edges.

3. Secure with 4 to 6 nails per shingle; use number of nails required by manufacturer or by code, whichever is greater. Nails must be long enough to penetrate through plywood or OSB, or 3/4 inch (19 mm) into dimensional lumber.
- B. Install hip and ridge shingles as required by the manufacturer. At ridges, install hip and ridge shingles over ridge or ridge vent material.
- C. Make valleys using "open valley" technique:
  1. Snap diverging chalk lines on metal flashing, starting at 3 inches (75 mm) each side of top of valley, spreading at 1/8 inch per foot (9 mm per meter) to eave.
  2. Run shingles to chalk line.
  3. Trim last shingle in each course to match chalk line; do not trim shingles to less than 12 inches (305 mm) width.
  4. Apply 2 inches (50 mm) wide strip of plastic cement under ends of shingles, sealing to metal flashing.
- D. Make valleys using "closed cut valley" technique:
  1. Run the first, and only the first, course of shingles from the higher roof slope across the valley at least 12 inches (305 mm).
  2. Run all courses of shingles from the lower roof slope across the valley at least 12 inches (305 mm) and nail not closer than 6 inches (150 mm) to center of valley.
  3. Run shingles from the upper roof slope into valley and trim 2 inches (50 mm) from center of valley.
- E. Make valleys using "woven valley" technique.
  1. Run shingles from both roof slopes at least 12 inches (305 mm) across center of valley, lapping alternate sides in a woven pattern.
  2. Nail not closer than 6 inches (150 mm) to center of valley.
- F. All penetrations are to be flashed according to GAF, ARMA and NRCA application instructions and construction details.
- G. For skylights, consult the manufacturer of the skylight or roof hatch for specific installation recommendations. Skylights and roof hatches shall be installed with pre-fabricated metal flashings specifically designed for the application of the unit.

### 3.6 INSTALLATION OF VENTILATION

- A. Code Requirements: Ventilation shall meet or exceed current FHA, HUD and local code requirements.
- B. Ridge Vents:
  1. Cut continuous vent slot through sheathing, stopping 6 inches (150 mm) from each end of ridge.
  2. On roofs without ridge board, make slot 2 inches (50 mm) wide, centered on ridge.
  3. On roofs with ridge board, make two slots 1-3/4 inches (89 mm) wide, one on each side.
  4. Install ridge vent material full length of ridge, including uncut areas.
  5. Butt ends of lengths of ridge vent material and join using plastic cement.
  6. Install eave vents in sufficient quantity to equal or exceed the ridge vent area, calculated as specified by manufacturer.
  7. Install ridge shingles over ridge vent material; use nails of specified length; do not drive nails home, leaving 3/4-inch (19 mm) slot open between ridge and roof shingles.

### 3.7 PROTECTION

- A. Stage work progress so that traffic is minimized over completed roofing.
- B. Protect installed products until completion of project

**END OF SECTION 07 31 13**

## SECTION 076200 - SHEET METAL FLASHING AND TRIM

### PART 1 - GENERAL

#### 1.1 SECTION REQUIREMENTS

- A. Submit Product Data, Shop Drawings, and Samples.

### PART 2 - PRODUCTS

#### 2.1 SHEET METAL

- A. Copper: ASTM B 370; temper H00, cold rolled, unless temper 060 is required for forming; at least 16 oz./sq. ft. (0.55 mm thick).
- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), 3003-H14, mill finish, minimum thickness of 0.040 inch (1.0 mm).
- C. Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet, minimum thickness of 0.0625 inch (1.6 mm) except at least 0.0937 inch (2.4 mm) thick for applications where burning (welding) is involved.

#### 2.2 FLASHING AND TRIM

- A. Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.
- B. Black Watch Memorial Library:
  1. All exposed flashing: Match Existing.
  2. Top of wall/cap flashing: refer to drawings.
- C. Finish aluminum gutters, downspouts, and similar exposed units with baked-on, white-acrylic shop finish; 1.0-mil (0.025-mm) dry film thickness.
  1. Match existing.

#### 2.3 ACCESSORIES

- A. Solder: ASTM B 32, Grade Sn50.
- B. Asphalt Mastic: SSPC-Paint 12, asbestos free, solvent type.
- C. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Comply with SMACNA's "Architectural Sheet Metal Manual." Allow for thermal expansion; set true to line and level. Install Work with laps, joints, and seams permanently watertight and weatherproof; conceal fasteners where possible.
  1. Roof-Edge Flashings: Secure metal flashings at roof edges according to FM Loss Prevention Data Sheet 1-49 for specified wind zone.
- B. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- C. Fabricate nonmoving seams in sheet metal with flat-lock seams.

1. Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), unless pre-tinned surface would show in finished Work.
- D. Separations: Separate non-compatible metals or corrosive substrates with a coating of asphalt mastic or other permanent separation.

**END OF SECTION 07620**

## SECTION 07 71 23 - GUTTERS AND DOWNSPOUTS

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Gutters and Downspouts.
- B. Related Accessories.

#### 1.2 RELATED SECTIONS

- A. Section 07 61 10 - Sheet Metal Roofing.
- B. Section 07 62 00 - Sheet Metal Flashing and Trim.
- C. Section 07 90 00 - Joint Sealers
- D. Section 33 46 00 - Sub Drainage: Connection of downspouts to sub-surface drainage.

#### 1.3 REFERENCES

- A. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- B. SMACNA - Architectural Sheet Metal Manual.

#### 1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Conform to applicable code for size and method of rain water discharge.
- B. American Architectural Manufacturers Association (AAMA) Specification 1405.1 "Specification for Aluminum Rain carrying Systems".
- C. FHA Minimum Property Standard 4900.1 for One- and Two-Family Dwellings.
- D. FHA Minimum Property Standard 4910.1 for Multi-Family Dwellings.

#### 1.5 SUBMITTALS

- A. Submit under provisions of Section 013300.
- B. Product Data: Manufacturer's catalog data, detail sheets, and specifications.
- C. Shop Drawings: Prepared specifically for this project; showing dimensions of metal gutters and accessories, fastening details and connections and interface with other products.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 5 inches (150 mm) square, representing the actual product, color, and patterns.

Match existing front elevation.

- F. Manufacturer's/Installer's Certificates: Certify products meet or exceed specified requirements.
- G. Manufacturer's/Installer's warranties.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
- B. Installer Qualifications: Certified and approved installer of the sheet metal roofing manufacturer.
- C. Perform Work in accordance with SMACNA Manual.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products to prevent twisting, bending, and abrasion, and to provide ventilation. Slope stored materials to drain.
- C. During storage prevent contact with materials capable of causing discoloration, staining, or other damage.

#### 1.8 PROJECT CONDITIONS

- A. Coordinate installation with installation of adjacent roofing, siding and related materials.

#### 1.9 WARRANTY

- A. Provide the Manufacturer's Limited 20-Year, pro-rated and non-transferable Warranty covering labor materials.

#### 1.10 COORDINATION

- A. Coordinate Work with other operations and installation of floor finish materials to avoid damage to installed underlayment and membrane materials.

### PART 2 PRODUCTS

#### 2.1 COMPONENTS

- A. Gutters: Aluminum sheet, ASTM B 209, Alloy 3105-H24. Minimum tensile strength 26,000 psi, minimum yield strength 25,000 psi or equivalent. Continuous and seamless sheet aluminum, roll formed.
  - 1. Thickness:
    - a. 0.032 inch (0.81 mm).
- B. Downspouts: Aluminum sheet, ASTM B 209, Alloy 3105-H24. Minimum tensile strength 26,000 psi, minimum yield strength 25,000 psi or equivalent.
  - 1. Thickness:
    - a. 0.019 inch (0.48 mm).
  - 2. Size:
    - a. 3 inches by 4 inches (76 mm by 102 mm).



- C. Endcaps: Aluminum sheet, ASTM B 209, Alloy 3105-H24, thickness 0.027 inch (0.69 mm).
- D. Gutter Hangers and Anchors: Aluminum sheet, ASTM B 209, Alloy 3105-H24, thickness 0.063 inch (1.60 mm). Provide types required to suit project requirements.
- E. Downspout Anchors: Aluminum. Provide types required to suit project requirements.
- F. Elbows: Aluminum sheet, ASTM B 209, Alloy 3105-H24. Minimum tensile strength 26,000 psi, minimum yield strength 25,000 psi or equivalent.
  - 1. Thickness:
    - a. 0.019 inch (0.48 mm).
  - 2. Size: To match downspouts.
- G. Gutter Guard:
  - 1. Size:
    - a. Aluminum mesh, 5 inch (127 mm) by 3 foot (914 mm).
    - b. Aluminum mesh, white, 5 inch (127 mm) by 3 foot (914 mm).
    - c. Aluminum mesh, 6 inch (152 mm) by 3 foot (914 mm).
- H. Gutter Screen:
  - 1. Size:
    - a. Aluminum screen, brown, 5 inch (127 mm) by 3 foot (914 mm).
    - b. Aluminum screen, white, 5 inch (127 mm) by 3 foot (914 mm).
- I. Aluminum Finish: two-coat system applied in a continuous baked-on process in a single operation, comprising of an acid-based primer and baked-on high performance linear polyester topcoat on exposed surfaces. Concealed surfaces finished with a polyester gold backer or wash coat.
  - 1. Color:
    - a. White.
- J. Sealant: Provide as specified in Section 07900.
- K. Fasteners: Same material and finish as gutters and downspouts.

## 2.2 FABRICATION

- A. Continuously form seamless gutters to the profiles and sizes specified.
- B. Form downspouts of profiles and sizes specified.
- C. Hem exposed edges of metal.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify governing dimensions at building.

- C. Verify surfaces are ready to receive gutters and downspouts.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Clean and repair if necessary, any adjoining work on which this work is in any way dependent for its proper installation.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install gutters using appropriate hangers to allow normal expansion and contraction.
- C. Install gutter hangers using two 1-1/4-inch (32 mm) screw shank nails and fastened into solid lumber.
- D. All gutters shall be in continuous length for each elevation (run). No end laps are allowed.
- E. Exercise care in placing aluminum in contact with other dissimilar metals or materials that are not compatible with aluminum.
- F. Providing adequate insulation/separation where ever necessary, such as by painting or otherwise protecting when they are in contact with aluminum or when drainage from them passes over aluminum surfaces.
- G. Install sealants where indicated to clean dry surfaces only without skips or voids.

### 3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION 07 71 23**

## SECTION 07 84 13 - PENETRATION FIRESTOPPING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Related Documents:
  - 1. Drawings and general provisions of the Subcontract apply to this Section.
  - 2. Review these documents for coordination with additional requirements and information that apply to work under this Section.
- B. Section Includes:
  - 1. Firestops for sealing penetrations through fire rated floors and walls.
  - 2. Standards and specifications for firestopping work.
  - 3. Firestop work shall conform to the requirements of this Section, but is a part of the section covering the actual penetration.
- C. Related Sections:
  - 1. Division 01 Section "General Requirements."
  - 2. Division 01 Section "Execution."
  - 3. Division 07 Section "Insulation".
  - 4. Division 07 Section "Applied Fireproofing".
  - 5. Division 07 Section "Joint Sealants".
  - 6. Divisions 21, 22, 23, and 26 for coordination with fire suppression, plumbing, HVAC and electrical work.

#### 1.2 REFERENCES

- A. General:
  - 1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
  - 2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
  - 3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.
- B. ASTM International:
  - 1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
  - 2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials
  - 3. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems
- C. BAAQMD Regulation 8-51 - Adhesive and Sealant Products.
- D. CBC - California Building Code, Chapter 7.
- E. Federal Specification HH-I-521F - Insulation Blankets, Thermal (Mineral Fiber, for Ambient Temperature).
- F. NEC - Nation Electrical Code.
- G. H. NFPA 70.
- H. UL Fire Resistance Directory.
  - 1. UL 1479 - Fire Tests of Through-Penetration Firestops.

#### 1.3 SYSTEM DESCRIPTION

- A. Specified firestopping systems are based on a solid sealant only, or combinations of solid sealant, foam sealant, and refractory fibers of thickness required to attain hour ratings.
- B. Systems shall:

1. Provide a flexible seal to prevent passage of fire, smoke, toxic gases and water through openings, and prevent transmission of sound and vibration from the penetrating element to the structure.
2. Provide hour ratings indicated and in accordance with ASTM E 814 or UL 1479.
3. Comply with requirements of CBC Sections 709.6, 709.7, 709.8, 710.2, 710.3 and 710.6, and CBC Standards 7-1 and 7-5.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Division 01 Section "General Requirements."
- B. Product Data: Manufacturer's specifications, product data, material safety data sheets, and installation instructions for each type of installation required, listing specific materials proposed.
- C. Shop Drawings: Manufacturer's detail drawings and applicable UL system numbers for firestop systems to be installed.
- D. Samples: Samples of each item when requested by Project Manager.
- E. Manufacturer's Recommendations: Manufacturer's written recommendations for installations or configurations not covered by a UL-listed firestop system.
- F. Test Reports: Manufacturer's published test reports. Include manufacturer's system number and UL listing for each type of penetration.
- G. Certification: Manufacturer's written certification that firestopping system(s) furnished comply with UL system requirements, are approved for each specific condition of use on the Project.
- H. Closeout Submittals:
  1. Sealant and adhesive quantity use in accordance with requirements of BAAQMD Regulation 8-51.
  2. Written guarantee.

#### 1.5 QUALITY ASSURANCE

- A. Firestopping systems shall be the products of one manufacturer Coordinate the work of the trades toward achieving this end.
- B. Installer Qualifications: Firm experienced in installation or application of systems similar in complexity to those required by this Project, and acceptable to or licensed by the product manufacturer.
- C. Regulatory Requirements:
  1. Comply with the requirements of Bay Area Air Quality Management District Regulation 8-51.
  2. Products shall be 100% asbestos and PCB free.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver firestopping materials to job site in factory sealed, unopened containers bearing manufacturer's name, brand, product designation, batch number and packaging date.
- B. Store in unopened containers. Follow manufacturer's recommendations for storage temperatures and shelf life.
- C. Follow manufacturer's recommendations for handling products containing toxic materials. Use recommended solvents and cleaning agents for cleaning tools, equipment and skin.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Requirements:
  1. Furnish adequate ventilation if using solvent.
  2. Furnish forced air ventilation during installation if required by manufacturer.
  3. Keep flammable materials away from sparks or flame.
  4. Provide masking and drop cloths to prevent contamination of adjacent surfaces by firestopping materials.

5. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
  - B. Existing Conditions: Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding. Proceed with installation only after penetrations of substrates have been completed and supporting brackets installed.
- 1.8 GUARANTEE
- A. Written guarantee agreeing to repair or replace firestopping which fails in joint adhesion, co-adhesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability, or appears to deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: DOW, 3M, Hilti, Nelson, or as otherwise specified.
- B. Established Standard: Unless otherwise specified, 3M products are specified to establish standards and type of materials required. Equal products of manufacturers specified above are acceptable.

### **2.2 MATERIALS**

- A. Sealant: Select among the following materials as appropriate.
  1. Solid (Elastomeric): 3M Fire Barrier Premium Latex CP 25WB+ Caulk, one-component elastomeric water-based latex sealant designed for use as a through-penetration firestop.
  2. Foam: 3M Fire Barrier 2001 Silicone RTV Foam, two-component silicone elastomer foam-in-place sealant designed to fill irregular or complex voids.
  3. Wrap Strip: 3M Fire Barrier FS-195+ Wrap Strip, fire resistive strip designed to be wrapped around the penetrating item and secured in place.
  4. Restricting Collar: 3M Fire Barrier RC-1 Restricting Collar, sheet metal, designed for use with wrap strip in combustible through-wall firestop penetration systems.
  5. Composite Sheet: 3M Fire Barrier CS-195+ Composite Sheet, elastomeric layer reinforced with mesh restraining wire and covered with aluminum foil on one side and bonded to sheet metal, forming a fire resistive sheet.
  6. Putty: 3M Fire Barrier MP Moldable Putty+ Pads and Sticks, one-component elastomeric formable putty, designed for use as a through-penetration firestop system.
  7. Spray: 3M FireDam Spray 100, flexible water-based coating.
  8. Primers: As recommended by sealant manufacturer.
- B. Pillows: Nelson PLW Firestop Pillow, Hilti FS Fire Block, dust proof chemical resistant cloth with heat-reactive expanding solidifying fill, designed for large openings that require frequent cable alterations.
- C. Safing Insulation: USG "Thermafiber Safing Insulation", 4 lb density mineral wool insulation unless indicated otherwise.
- D. Damming Materials: As recommended by firestop manufacturer.

## **PART 3 - EXECUTION**

### **3.1 CONDITION OF SURFACES**

- A. Inspect surfaces to receive firestopping materials and report any defects to Project Manager. Do not start work until defects have been corrected. Starting work implies acceptance of surfaces as satisfactory.

- B. Unless otherwise permitted by manufacturer, do not apply firestopping materials to polycarbonates; materials that bleed oils, plasticizers or solvents; organo-metallic compounds; silicone rubber containing organo-tin compound; sulfur, polysulfides, polysulfones and other sulfur containing materials; amines, urethanes and amine-containing materials; and unsaturated hydrocarbon plasticizers.
- C. Do not apply materials in confined spaces where material is not exposed to atmospheric moisture.

### 3.2 PREPARATION

- A. Thoroughly clean surfaces and spaces to receive firestopping materials, removing foreign matter such as dirt, dust, moisture, rust, laitance, mill scale, oil, paint, lacquer, form coatings, water repellents and protective coatings.
- B. Do not use cleaning solvents which leave residue. Wipe joints free of solvent using clean, dry white cloths or white lintless paper. Do not use alcohol or alcohol-based materials. Do not permit solvent to air dry. Do not use detergents or soap and water solutions for cleaning unless specifically recommended by the sealant manufacturer.
- C. Follow manufacturer's directions for specific products and surfaces.

### 3.3 MIXING

- A. Job mix foam sealants in accordance with manufacturer's directions using approved equipment.
- B. Stir separate parts of multi-component sealants until settled fillers and pigments and any surface liquid are thoroughly dispersed.
- C. Combine separate parts in accordance with mixing instructions.

### 3.4 INSTALLATION

- A. Install systems in accordance with UL systems, and manufacturer's specifications and recommendations, using approved equipment and so as to achieve the required fire rating.
- B. Surface Preparation: Prepare surfaces as recommended by manufacturer immediately prior to installation of firestopping materials. If primers are used, make preliminary tests to ensure that primers will not stain exposed materials.
- C. Masking: Mask surrounding areas where necessary to prevent stains on exposed finished surfaces. Do not apply masking to surfaces which are to receive sealant materials. Remove masking immediately following completion of sealant work.
- D. Damming: Form leakproof dams as required to seal openings and contain sealant materials until cure is complete. Follow sealant manufacturer's recommendations.
- E. Sealing:
  - 1. Solid Sealant: For small spaces and where exposed to view in wall face. Immediately tool completed seal to slightly concave surface using recommended tooling agent.
  - 2. Foam:
    - a. Use automatic metering, mixing, and dispensing equipment for large volume applications; factory prepared cartridges may be used for small volumes.
    - b. In general, use foam sealant for all applications except where solid sealant is permitted.
    - c. When sealant has cured, neatly trim excess where exposed to view.
  - 3. Spray: Install in accordance with manufacturer's recommendations and requirements for specific use.

### 3.5 FIELD QUALITY CONTROL

- A. Perform manufacturer's quality control check program at least once daily and upon changing to new lot of materials.
- B. Inspect cured seals after 24 hours by removing damming materials to examine seals. Replace dams where a required part of assembly.

- C. Where voids occur, fill with freshly mixed foam or solid sealant. Re-inspect after added material has cured 24 hours.
  - D. Ensure that cured foam sealants show acceptable or better color and cell structure range per manufacturer's recommendations.
  - E. Remove unacceptable sealants and replace with new.
- 3.6 CLEANING
- A. Clean adjacent surfaces soiled by firestopping work.

**END OF SECTION 07 84 13**

## SECTION 079200 - JOINT SEALANTS

### 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. Silicone joint sealants.
  - 2. Urethane joint sealants.
  - 3. Acoustical joint sealants.
- B. Related Sections:
  - 1. Division 08 Section "Glazing" for glazing sealants.
  - 2. Division 09 Section "Gypsum Board" for sealing perimeter joints.
  - 3. Division 09 Section "Tiling" for sealing tile joints.
  - 4. Division 32 Section "Concrete Paving Joint Sealants" for sealing joints in pavements, walkways, and curbing.

#### 1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in **1/2-inch**-wide joints formed between two **6-inch**-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
  - 1. Joint-sealant application, joint location, and designation.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation.
  - 4. Joint-sealant color.
- E. Qualification Data: For qualified Installer.
- F. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.



- G. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
- I. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
  - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
  - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- J. Warranties: Sample of special warranties.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.
- D. Pre-installation Conference: Conduct conference at Project site.

#### 1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer [**or are below 40 deg F.**
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

#### 1.6 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
  1. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
  1. Architectural Sealants: 250 g/L.
  2. Sealant Primers for Nonporous Substrates: 250 g/L.
  3. Sealant Primers for Porous Substrates: 775 g/L.
- C. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
  1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- D. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- E. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food; provide products that comply with 21 CFR 177.2600.
- F. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

## 2.2 SILICONE JOINT SEALANTS

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.
  - 1. Products: Subject to compliance with requirements available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Dow Corning Corporation; 790.
    - b. Pecora Corporation;
    - c. Sika Corporation, Construction Products Division; SikaSil-C990.
    - d. Tremco Incorporated;
  
- B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. BASF Building Systems; Omniseal 50.
    - b. Dow Corning Corporation; 795
    - c. Pecora Corporation; [
    - d. Polymeric Systems, Inc.; PSI-641.
    - e. Sika Corporation, Construction Products Division; SikaSil-C995.
    - f. Tremco Incorporated;
  
- C. Single-Component, Nonsag, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use T.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Dow Corning Corporation; NS Parking Structure Sealant.
    - b. May National Associates, Inc.; Bondaflex Sil 728 NS.
    - c. Pecora Corporation;
    - d. Tremco Incorporated; Spectrem 800.
  
- D. Mildew-Resistant, Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.
  - 1. Products: Subject to compliance with requirements available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Pecora Corporation; 898.

## 2.3 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C 920. Type S, Grade NS, Class 25, for Use T.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. BASF Building Systems; Sonolastic NP1.
    - b. May National Associates, Inc.; Bondaflex PUR 40 FC.
    - c. Pacific Polymers International, Inc.; Elasto-Thane 230 Type II.
    - d. Sika Corporation, Construction Products Division; Sikaflex - 1a.
    - e. Tremco Incorporated; Vulkem 116.

## 2.4 LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. BASF Building Systems; Sonolac.
    - b. Bostik, Inc.; Chem-Calk 600.
    - c. Pecora Corporation; AC-20+.
    - d. Schnee-Morehead, Inc.; SM 8200.
    - e. Tremco Incorporated; Tremflex 834.

## 2.5 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, non-staining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Pecora Corporation; AC-20 FTR.
    - b. USG Corporation; SHEETROCK Acoustical Sealant.

## 2.6 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

## 2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Non-staining, non-absorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after

cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

- a. Concrete.
  - b. Unglazed surfaces of ceramic tile.
3. Remove laitance and form-release agents from concrete.
  4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
    - a. Metal.
    - b. Glass.
    - c. Porcelain enamel.
    - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  1. Do not leave gaps between ends of sealant backings.
  2. Do not stretch, twist, puncture, or tear sealant backings.
  3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.

a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

G. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

### 3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### 3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

### 3.6 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

1. Joint Locations:

- a. Isolation and contraction joints in cast-in-place concrete slabs.
    - b. Joints between different materials listed above.
    - c. .
  - 2. Silicone Joint Sealant: Single component, nonsag, traffic grade, neutral curing.
  - 3. Urethane Joint Sealant: Single component, nonsag, traffic grade] [Single component, pourable, traffic grade.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal non-traffic surfaces.
- 1. Joint Locations:
    - a. Construction joints in cast-in-place concrete.
    - b. Joints between metal panels.
    - c. Joints between different materials listed above.
    - d. Perimeter joints between materials listed above and frames of doors and windows, and other exterior openings.
    - e. Control and expansion joints in overhead surfaces.
  - 2. Silicone Joint Sealant: Single component, nonsag, neutral curing, Class 100/50
- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
- 1. Joint Locations:
    - a. Isolation joints in cast-in-place concrete slabs.
  - 2. Urethane Joint Sealant: Single component, nonsag, traffic grade
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces.
- 1. Joint Locations:
    - a. Control and expansion joints on exposed interior surfaces of exterior walls.
    - b. Perimeter joints of exterior openings where indicated.
    - c. Tile control and expansion joints.
    - d. Vertical joints on exposed surfaces of walls and partitions.
    - e. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
  - 2. Joint Sealant: Latex
- E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces.
- 1. Joint Sealant Location:
    - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - b. Tile control and expansion joints where indicated.



2. Joint Sealant: Mildew resistant, single component, nonsag, neutral curing, Silicone
- F. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal non-traffic surfaces.
1. Joint Location:
    - a. Acoustical joints where indicated.
    - b. Other joints as indicated.

**END OF SECTION 07 92 00**

## SECTION 081113- HOLLOW METAL DOORS AND FRAMES

### PART 1 GENERAL

1. WORK INCLUDED
  - A. Non-rated rolled steel doors and frames.
2. RELATED WORK
  - A. Section 087100 - Door Hardware.
  - B. Section 088000 - Glazing.
  - C. Section 099100 - Painting: Field painting of doors and frames.
3. REFERENCES
  - A. ASTM E152 - Methods of Fire Tests of Door Assemblies.
  - B. DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames, and Builder's Hardware.
  - C. NFPA 80 - Fire Doors and Windows.
  - D. NFPA 252 - Fire Tests for Door Assemblies.
  - E. SDI-100 - Standard Steel Doors and Frames.
  - F. SDI-105 - Recommended Erection Instructions for Steel Frames.
  - G. UL 10B - Fire Tests of Door Assemblies.
4. QUALITY ASSURANCE
  - A. Conform to requirements of SDI-100.
5. SUBMITTALS
  - A. Submit shop drawings and product data under provisions of Section 013300.
  - B. Indicate frame configuration, anchor types and spacings, location of cutouts for hardware, reinforcement, and finish.
  - C. Indicate door elevations, internal reinforcement, closure method, and cut outs for glazing.

- D. Submit manufacturer's installation instructions under provisions of Section 013300.
- 6. DELIVERY, STORAGE AND PROTECTION
  - A. Protect products under provisions of Section 016000.
  - B. Protect doors with resilient packaging sealed with heat shrunk plastic.
  - C. Break seal on-site to permit ventilation.

## PART 2 PRODUCTS

- 1. DOORS AND FRAMES
  - A. Exterior Doors: SDI-100 Grade III Model 2. Galvanized.
  - B. Interior Doors: SDI-100 Grade II Model 2.
  - C. Exterior Frames: 16 gage material, Galvanized.
  - D. Interior Frames: 16 gage material.
- 2. DOOR CORE
  - A. Core: Polyurethane insulation - exterior and interior; internal steel stiffeners - exterior.
  - B. Insulated door insulation value of R-16.
- 3. ACCESSORIES
  - A. Rubber Silencers Resilient rubber.
  - B. Glazing Stops: Rolled steel channel shape, butted or mitered corners; prepared for countersink style screws.
- 4. PROTECTIVE COATINGS
  - A. Bituminous Coating: Fibered asphalt emulsion.
  - B. Primer: Zinc chromate type.
- 5. FABRICATION
  - A. Fabricate frames for full welded mitered joint assembly.
  - B. Fabricate frames and doors with hardware reinforcement plates welded in place.

- C. Prepare frame for silencers. Provide three single rubber silencers for single doors on strike side, and two single silencers on frame head at double doors without mullions.
  - D. Close top edge of exterior door flush with inverted steel channel closure. Seal joints watertight.
  - E. Fabricate doors with seamless edges.
6. FINISH
- A. Interior Units: primed.
  - B. Exterior Units: 0.60 oz/sq ft galvanized and primed.
  - C. Primer: Baked on.

### PART 3 EXECUTION

1. INSTALLATION
- A. Install frames in accordance with SDI-105.
  - B. Install doors in accordance with DHI.
  - C. Coordinate with wall construction for anchor placement.
  - D. Coordinate installation of glass and glazing.
2. TOLERANCES
- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.
3. ADJUSTING AND CLEANING
- A. Adjust hardware for smooth and balanced door movement.

**END OF SECTION 08 11 13**

## SECTION 08 52 13 ALUMINUM-CLAD WOOD DOUBLE-HUNG WINDOWS

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Aluminum-clad wood double-hung windows.
- B. Aluminum-clad wood casement windows.
- C. Aluminum-clad wood awning windows.

#### 1.2 RELATED SECTIONS

- A. Section 07270 (07 27 00) - Air Barriers: Water-resistant barrier.
- B. Section 07920 (07 92 00) - Joint Sealants: Sealants and caulking.

#### 1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
  - 1. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Doors.
  - 2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
  - 3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. American Society for Testing and Materials (ASTM):
  - 1. ASTM B 117 - Operating Salt Spray (Fog) Apparatus.
  - 2. ASTM C 1036 - Flat Glass.
  - 3. ASTM C 1048 - Heat-Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated Glass.
  - 4. ASTM D 1149 - Rubber Deterioration – Surface Ozone Cracking in a Chamber.
  - 5. ASTM D 2803 - Filiform Corrosion Resistance of Organic Coatings on Metal.
  - 6. ASTM D 3656 - Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns.
  - 7. ASTM D 4060 - Abrasion Resistance of Organic Coatings by the Taber Abraser.
  - 8. ASTM E 283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.
  - 9. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
  - 10. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential.
  - 11. ASTM E 1105 – Standard Test Method for Field Determination of Water Penetration of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
  - 12. ASTM G 85 - Modified Salt Spray (Fog) Testing.
- C. Screen Manufacturers Association (SMA):
  - 1. SMA 1201 - Specifications for Insect Screens for Windows, Sliding Doors and Swinging Doors.
- D. Window and Door Manufacturers Association (WDMA):
  - 1. AAMA/WDMA/CSA 101/I.S.2/A440 – North American Fenestration Standard/Specification for windows, doors and skylights
  - 2. WDMA I.S.4 - Industry Specification for Preservative Treatment for Millwork.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Windows shall be Hallmark certified to a rating of H-LC30-LC50 specifications in accordance with ANSI/AAMA/WDMA 101/I.S.2/A440-08 or ANSI/AAMA/WDMA 101/I.S.2/A440-11.
- B. Window Unit Air Leakage, ASTM E 283, 1.57 psf (25 mph): 0.3 cfm per square foot of frame or less.
- C. Window Unit Water Penetration: No water penetration through window unit when tested in accordance with ASTM E 547, under static pressure of [4.5 psf (42 mph)] [7.5 psf (52 mph)] after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per hour per square foot.

**1.5 SUBMITTALS**

- A. Comply with Division 1 requirements.
- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.
- D. Samples: Submit full-size or partial full-size sample of window illustrating glazing system, quality of construction, and color of finish.  
Warranty: Submit manufacturer's standard warranty.

**1.6 QUALITY ASSURANCE**

- A. Mockup:
  - 1. Provide sample installation for field testing window performance requirements and to determine acceptability of window installation methods.
  - 2. Approved mockup shall represent minimum quality required for the Work.
  - 3. Approved mockup shall [not] remain in place within the Work.

**1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery: Deliver materials to site undamaged in manufacturer's or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.
- B. Storage: Store materials in an upright position, off ground, under cover, and protected from weather, direct sunlight, and construction activities.
- C. Handling: Protect materials and finish during handling and installation to prevent damage.

**PART 2 PRODUCTS**

**2.1 MANUFACTURER**

- A. Pella Corporation, 102 Main Street, Pella, Iowa 50219. Toll Free (800) 54-PELLA. Phone (641) 621-1000. Website [www.pella.com](http://www.pella.com).

**2.2 ALUMINUM-CLAD WOOD DOUBLE-HUNG WINDOWS**

- A. Aluminum-Clad Wood Double-Hung Windows: Pella® 450 Series, factory-assembled aluminum-clad wood double-hung windows. Sash shall tilt to interior without removal for cleaning.
- B. Frame:
  - 1. Select softwood, water-repellent, preservative-treated with EnduraGuard® in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the frame.
  - 2. Interior Exposed Surfaces: Clear Pine with no visible fastener holes.
  - 3. Exterior Surfaces: Clad with aluminum.

4. Overall Frame Depth: 5 inches (127 mm).

C. Sash:

1. Select softwood, water water-repellent, preservative-treated with EnduraGuard in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the sash.
2. Interior Exposed Surfaces: Clear Pine with no visible fastener holes.
3. Exterior Surfaces: Clad with aluminum, lap-jointed at corners.
4. Corners: Mortised and tenoned, glued and secured with metal fasteners.
5. Operable sash tilt to interior for cleaning or removal.
6. Extruded acrylonitrile butadiene styrene glazing flange. Flange is located on top of wood sash members and under exterior aluminum cladding.
7. Sash Thickness: 1-5/8 inches.

D. Weather Stripping:

1. Foam with 3-mil vinyl skin at frame head and at lower sash bottom rail.
2. Thermal-plastic elastomer with slip-coating set into upper sash for tight contact at checkrail.
3. Secondary polyvinyl chloride (PVC) leaf-type weather strip on bottom sash at sill.

## 2.3 GLAZING

A. Glazing:

1. Float Glass: ASTM C 1036, Quality 1.
  - a. Tempered Glass: ASTM C 1048 as required.
2. Type: Silicone-glazed 11/16-inch dual-seal, annealed, tempered only as required, insulating glass, clear, multi-layer Low-E coated with argon.

B. Glazing:

1. Float Glass: ASTM C 1036, Quality 1.
  - a. Tempered Glass: ASTM C 1048.

## 2.4 OPTIONS

A. Insect Screens: Standard.

1. Compliance: ASTM D 3656 and SMA 1201.
2. Screen Cloth: Vinyl-coated fiberglass, 18/16 mesh.
3. Set in aluminum frame fitted to outside of window for double-hung units and inside of window for casement and awning windows.
4. Complete with necessary hardware.
5. Screen Frame Finish: Baked enamel.
  - a. Color: Finish to match exterior window cladding.

## 2.5 HARDWARE

A. Balances:

1. Block-and-tackle balances.
2. Balances are attached to frame and connected to sash with polyester cord.

B. Locking System:

1. Self-aligning sash lock factory-installed.
2. One installed on units with frame width less than 37 inches, 2 locks installed on units with frame width of 37 inches or greater.
3. One installed on units with frame width less than 37 inches, 2 locks installed on units with frame

width of 37 inches or greater.

C. Sash Lifts:

1. Sash lift furnished for field installation.
2. One sash lift on units with frame width less than 37 inches, 2 sash lifts on units with frame width of 37 inches or greater.

D. Lock and Sash Lift Finish: Standard.

E. Limited Opening Device: Factory applied in stainless steel device concealed from view. Nominal 3-3/4" opening.

## 2.6 TOLERANCES

A. Windows shall accommodate the following opening tolerances:

1. Vertical Dimensions Between High and Low Points: Plus 1/4 inch, minus 0 inch.
2. Width Dimensions: Plus 1/4 inch, minus 0 inch.
3. Building Columns or Masonry Openings: Plus, or minus 1/4 inch from plumb.

## 2.7 FINISH

A. Exterior Finish System: Pella EnduraClad.

1. Exterior aluminum surfaces shall be finished with the following multi-stage system:
  - a. Clean and etch aluminum surface of oxides.
  - b. Pre-treat with conversion coating.
  - c. Top coat with baked-on polyester enamel.
2. Color: T.B.D.
3. Performance Requirements: Exterior aluminum finishes shall meet or exceed all performance requirements of AAMA 2603 and the following performance requirements of AAMA 2605:
  - a. Dry Film Hardness: Eagle Turquoise Pencil, H minimum.
  - b. Film Adhesion: 1 mm crosshatch, dry, wet, boiling water.
  - c. Impact Resistance: 1/10-inch distortion, no film removal.
  - d. Chemical Resistance: 10 percent Muriatic acid, 15 minutes. Mortar pat test, 24 hours.
  - e. Detergent Resistance: 3 percent at 100 degrees F, 72 hours.
  - f. Corrosion Resistance: ASTM G85-A5, 2000 hours. Humidity, 3,000 hours. Salt spray exceeds 3,000 hours.

B. Interior Finish: T.B.D. by owner.

## 2.8 INSTALLATION ACCESSORIES

A. Flashing/Sealant Tape: Pella SmartFlash.

1. Aluminum-foil-backed butyl window and door flashing tape.
2. Maximum Total Thickness: 0.013 inch.
3. UV resistant.
4. Verify sealant compatibility with sealant manufacturer.

B. Interior Insulating-Foam Sealant: Low-expansion, low-pressure polyurethane insulating window and door foam sealant.

C. Exterior Perimeter Sealant: "Pella Window and Door Installation Sealant" or equivalent high quality, multi-purpose sealant as specified in the joint sealant section.

## 2.9 SOURCE QUALITY CONTROL

A. Factory Testing: Factory test individual standard operable windows for air infiltration in accordance with



ASTM E 283, to ensure compliance with this specification.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine areas to receive windows. Notify Architect/Engineer of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

#### **3.2 INSTALLATION**

- A. Install windows in accordance with manufacturer's instructions and approved shop drawings.
- B. Install windows to be weather-tight and freely operating.
- C. Maintain alignment with adjacent work.
- D. Secure assembly to framed openings, plumb and square, without distortion.
- E. Integrate window system installation with exterior weather-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with weather-resistant barrier using watershed principles in accordance with window manufacturer's instructions.
- F. Place interior seal around window perimeter to maintain continuity of building thermal and air barrier using insulating-foam sealant.
- G. Seal window to exterior wall cladding with sealant and related backing materials at perimeter of assembly.
- H. Leave windows closed and locked.

#### **3.4 CLEANING**

- A. Clean window frames and glass in accordance with Division 1 requirements.
- B. Do not use harsh cleaning materials or methods that would damage finish.
- C. Remove labels and visible markings.

#### **3.5 PROTECTION**

- A. Protect installed windows to ensure that, except for normal weathering, windows will be without damage or deterioration at time of substantial completion.

**END OF SECTION 08 52 13**

## SECTION 087100 - DOOR HARDWARE

### 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. Mechanical door hardware for the following:
    - a. Swinging doors.
  - 2. Cylinders for door hardware specified in other Sections.
- B. Related Sections:
  - 1. Division 08 Section "Hollow Metal Doors and Frames" for door silencers provided as part of hollow-metal frames.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Other Action Submittals:
  - 1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
    - a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
    - b. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.
    - c. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.

- d. Content: Include the following information:
  - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
  - 2) Locations of each door hardware set cross-referenced to Drawings on floor plans and to door and frame schedule.
  - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
  - 4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.
  - 5) Fastenings and other pertinent information.
  - 6) Explanation of abbreviations, symbols, and codes contained in schedule.
  - 7) Mounting locations for door hardware.
  - 8) List of related door devices specified in other Sections for each door and frame.
- 2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

C. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.

D. Warranty: Special warranty specified in this Section.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
  - 1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
  - 2. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
- C. Source Limitations: Obtain each type of door hardware from a single manufacturer.
  - 1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

- D. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- E. Means of Egress Doors: Latches do not require more than **15 lbf** to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- F. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ICC/ANSI A117.1.
  - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than **5 lbf**.
  - 2. Comply with the following maximum opening-force requirements:
    - a. Interior, Non-Fire-Rated Hinged Doors: **5 lbf** applied perpendicular to door.
  - 3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than **1/2 inch** high.
  - 4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point **3 inches** from the latch, measured to the leading edge of the door.
- G. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." In addition to Owner, Contractor, and Architect, conference participants shall also include Installer's Architectural Hardware Consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
  - 1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
  - 2. Preliminary key system schematic diagram.
  - 3. Requirements for key control system.
  - 4. Requirements for access control.
  - 5. Address for delivery of keys.
- H. Pre-installation Conference: Conduct conference at Project site.
  - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Inspect and discuss preparatory work performed by other trades.
  - 3. Inspect and discuss electrical roughing-in for electrified door hardware.
  - 4. Review sequence of operation for each type of electrified door hardware.
  - 5. Review required testing, inspecting, and certifying procedures.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

- B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
- C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
- D. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

#### 1.6 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

#### 1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including excessive deflection, cracking, or breakage.
    - b. Faulty operation of doors and door hardware.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
  - 2. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.
    - a. Electromagnetic and Delayed-Egress Locks: Five years from date of Substantial Completion.
    - b. Exit Devices: Two years from date of Substantial Completion.
    - c. Manual Closers: 10 years from date of Substantial Completion.

## 1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door and door hardware operation. Provide parts and supplies that are the same as those used in the manufacture and installation of original products.

## PART 2 - PRODUCTS

### 2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" and on the Drawings to comply with requirements in this Section.
  - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products.
  - 2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
  - 1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.
  - 2. References to BHMA Designations: Provide products complying with these designations and requirements for description, quality, and function.

### 2.2 HINGES

- A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Bommer Industries, Inc.
    - b. Hager Companies.

- c. IVES Hardware; an Ingersoll-Rand company.
- d. McKinney Products Company; an ASSA ABLOY Group company.

### 2.3 SELF-CLOSING HINGES AND PIVOTS

### 2.4 CONTINUOUS HINGES

- A. Continuous Hinges: BHMA A156.26; minimum **0.120-inch**-thick, hinge leaves with minimum overall width of **4 inches**; fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete.
- B. Continuous, Gear-Type Hinges: Extruded-aluminum, pinless, geared hinge leaves joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Hager Companies.
    - b. IVES Hardware; an Ingersoll-Rand company.
    - c. McKinney Products Company; an ASSA ABLOY Group company.
    - d. Select Products Limited.

### 2.5 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: As indicated in door hardware schedule.
- B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
  - 1. Bored Locks: Minimum **1/2-inch** latchbolt throw.
  - 2. Mortise Locks: Minimum **3/4-inch** latchbolt throw.
  - 3. Deadbolts: Minimum **1-inch** bolt throw.
- C. Lock Backset: **2-3/4 inches**, unless otherwise indicated.
- D. Lock Trim:
  - 1. Operating Device: Lever with escutcheons (roses).
- E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
  - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
- F. Bored Locks: BHMA A156.2; Grade **[1] [2]**; Series 4000.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Best Access Systems; Div. of Stanley Security Solutions, Inc.
    - b. Corbin Russwin Architectural Hardware; n ASSA ABLOY Group Company.
    - c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    - d. Schlage Commercial Lock Division; an Ingersoll-Rand company.
- G. Mortise Locks: BHMA A156.13; Operational Grade 1; stamped steel case with steel or brass parts; Series 1000.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Best Access Systems; Div. of Stanley Security Solutions, Inc.
    - b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
    - c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    - d. Schlage Commercial Lock Division; an Ingersoll-Rand company.

## 2.6 EXIT LOCKS AND EXIT ALARMS

- A. Exit Locks and Alarms: BHMA A156.29, Grade 1.
1. Manufacturers: Subject to compliance with requirements, **[provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
  2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on **[Drawings] [schedule]** or comparable product by one of the following:
    - a. Arrow USA; an ASSA ABLOY Group company.
    - b. Detex Corporation.
    - c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    - d. **<Insert manufacturer's name>**.

## 2.7 EXIT DEVICES AND AUXILIARY ITEMS

- A. Exit Devices and Auxiliary Items: BHMA A156.3.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Adams Rite Manufacturing Co.; an ASSA ABLOY Group company.
    - b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
    - c. Detex Corporation.



- d. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
- e. Von Duprin; an Ingersoll-Rand company.

## 2.8 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
  - 1. Manufacturer: Same manufacturer as for locking devices.
- B. Standard Lock Cylinders: BHMA A156.5; Grade [1] [1A] [2]; permanent cores that are interchangeable; face finished to match lockset.
- C. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.
- D. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 3 construction master keys.

## 2.9 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
  - 1. Existing System:
    - a. Master key or grand master key locks to Owner's existing system.
- B. Keys: Brass.
  - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
    - a. Notation: "**DO NOT DUPLICATE.**"
  - 2. Quantity: In addition to one extra key blank for each lock, provide the following:
    - a. Cylinder Change Keys: Three.
    - b. Master Keys: Three.

## 2.10 KEY CONTROL SYSTEM

- A. Key Control Cabinet: BHMA A156.5; metal cabinet with baked-enamel finish; containing key-holding hooks, labels, 2 sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of 150 percent of the number of locks.
  - 1. Portable Cabinet: Tray for mounting in file cabinet, equipped with key-holding panels, envelopes, and cross-index system.

## 2.11 SURFACE CLOSERS

- A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
    - b. LCN Closers; an Ingersoll-Rand company.
    - c. Norton Door Controls; an ASSA ABLOY Group company.
    - d. SARGENT Manufacturing Company; an ASSA ABLOY Group company.

## 2.12 DOOR GASKETING

- A. Door Gasketing: BHMA A156.22; air leakage not to exceed **0.50 cfm per foot** of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Hager Companies.
    - b. National Guard Products.
    - c. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    - d. Reese Enterprises, Inc.

## 2.13 THRESHOLDS

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Hager Companies.
    - b. National Guard Products.
    - c. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    - d. Reese Enterprises, Inc.

## 2.14 AUXILIARY ELECTRIFIED DOOR HARDWARE

### A. Auxiliary Electrified Door Hardware:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. DynaLock Corp.
  - b. GE Security, Inc.
  - c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
  - d. Schlage Commercial Lock Division; an Ingersoll-Rand company.
  - e. Securitron Magnalock Corporation; an ASSA ABLOY Group company.
  - f. Security Door Controls.

## 2.15 FABRICATION

### A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

### B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

### C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Fire-Rated Applications:
  - a. Steel Through Bolts: For the following unless door blocking is provided:
    - 1) Surface hinges to doors.
    - 2) Closers to doors and frames.
    - 3) Surface-mounted exit devices.
3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.

4. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

## 2.16 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

### 3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
  1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
  2. Custom Steel Doors and Frames: HMMA 831.
- B. Install each door hardware item to comply with manufacturer's 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 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every **30 inches** of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
1. Replace construction cores with permanent cores as directed by Owner.
  2. Furnish permanent cores to Owner for installation.
- E. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- F. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, in mechanical equipment room. Verify location with Architect.
1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.
- G. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- H. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- I. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- J. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- 3.4 FIELD QUALITY CONTROL
- A. Independent Architectural Hardware Consultant: Owner will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

### 3.5 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.
  - 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
  - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
  - 3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately **three** months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

### 3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

### 3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

### 3.8 DOOR HARDWARE SCHEDULE

- A. Refer to drawings.

**END OF SECTION 087100**

## SECTION 092900 - GYPSUM BOARD

### 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. Interior gypsum board.
  - 2. Tile backing panels.
- B. Related Requirements:
  - 1. Division 09 Section "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.
  - 2. Division 09 Section "Tiling" for cementitious backer units installed as substrates for ceramic tile.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For the following products:
  - 1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

#### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

#### 1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- B. Low Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

### 2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

### 2.3 INTERIOR GYPSUM BOARD

- 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. American Gypsum.
  - 2. CertainTeed Corp.
  - 3. Georgia-Pacific Gypsum LLC.
  - 4. Lafarge North America Inc.
  - 5. National Gypsum Company.
  - 6. PABCO Gypsum.
  - 7. Temple-Inland.
  - 8. USG Corporation.
- B. Gypsum Wallboard: ASTM C 1396/C 1396M.
  - 1. Thickness: 5/8 inch.
  - 2. Long Edges: Tapered.
  - 3. Type: Type-X



- C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
  - 1. Thickness: 5/8 inch.
  - 2. Long Edges: Tapered.
  - 3. Type: Type-X
  
- D. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
  - 1. Thickness: 5/8 inch.
  - 2. Long Edges: Tapered.
  - 3. Type: Type-X
  - 4. Mold Resistance: ASTM D 3273, score of 10.

## 2.4 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. CertainTeed Corp.; GlasRoc Tile Backer.
    - b. Georgia-Pacific Gypsum LLC; DensShield Tile Backer.
  - 2. Core: 1/2 inch, regular type.
  - 3. Mold Resistance: ASTM D 3273, score of 10.

## 2.5 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
  - 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
  - 2. Shapes:
    - a. Cornerbead.
    - b. Bullnose bead.
    - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
    - d. L-Bead: L-shaped; exposed long flange receives joint compound.
    - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
    - f. Expansion (control) joint.
    - g. Curved-Edge Cornerbead: With notched or flexible flanges.

## 2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.

- B. Joint Tape:
  - 1. Interior Gypsum Board: Paper.
  - 2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
  - 3. Tile Backing Panels: As recommended by panel manufacturer.
  
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
  - 1. Pre-filling: At open joints and damaged surface areas, use setting-type taping compound.
  - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
    - a. Use setting-type compound for installing paper-faced metal trim accessories.
  - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
  - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
  - 5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound or high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.
  
- D. Joint Compound for Tile Backing Panels:
  - 1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
  - 2. Cementitious Backer Units: As recommended by backer unit manufacturer.
  - 3. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

## 2.7 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
  
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
  - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from **0.033 to 0.112 inch** thick.
  - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
  
- C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
  - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

2. Recycled Content of Blankets: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.
- D. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, non-staining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Products: Subject to compliance with requirements available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
    - b. Grabber Construction Products; Acoustical Sealant GSC.
    - c. Pecora Corporation;
    - d. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
    - e. USG Corporation; SHEETROCK Acoustical Sealant.
  2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  3. Acoustical joint sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than **1/16 inch** of open space between panels. Do not force into place.

- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc., except in chases braced internally).
  - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
  - 2. Fit gypsum panels around ducts, pipes, and conduits.
  - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2- inches-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

### 3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
  - 1. Wallboard Type: Vertical surfaces unless otherwise indicated.
  - 2. Flexible Type: Apply in double layer at curved assemblies.
  - 3. Ceiling Type: Ceiling surfaces.
  - 4. Moisture- and Mold-Resistant Type: Bath rooms and mechanical rooms.
- B. Single-Layer Application:
  - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.

2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated and minimize end joints.
  - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Curved Surfaces:

1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus **12-inch**-long straight sections at ends of curves and tangent to them.
2. For double-layer construction, fasten base layer to studs with screws **16 inches** o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced **12 inches** o.c.

### 3.4 APPLYING GYPSUM PANELS FOR CEILINGS AND SOFFITS

- A. Apply panels perpendicular to supports, with end joints staggered and located over supports.
  1. Install with **1/4-inch** open space where panels abut other construction or structural penetrations.
  2. Fasten with corrosion-resistant screws.

### 3.5 APPLYING TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at locations indicated to receive tile. Install with **1/4-inch** gap where panels abut other construction or penetrations.
- B. Water-Resistant Backing Board: Install where indicated with **1/4-inch** gap where panels abut other construction or penetrations.
- C. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

### 3.6 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joint at locations indicated on Drawings and according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners.
2. LC-Bead: Use at exposed panel edges.
3. Curved-Edge Cornerbead: Use at curved openings.

### 3.7 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Pre-fill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
  1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
  2. Level 4: At panel surfaces that will be exposed to view.
    - a. Primer and its application to surfaces are specified in other Division 09 Sections.
- E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.

### 3.8 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

**END OF SECTION 09 29 00**

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## SECTION 09 65 00 - RESILIENT FLOORING

### 1. PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Resilient tile flooring.
- B. Resilient base.

#### 1.2 REFERENCES

- A. ASTM E84 - Surface Burning Characteristics of Building Materials.
- B. FS L-F-1641 - Floor Covering, Translucent or Transparent Vinyl Surface, with Backing.
- C. FS L-F-475 - Floor Covering, Vinyl Surface (Tile and Roll), with Backing.
- D. FS RR-T-650 - Treads, Metallic and Non-metallic, Non-skid.
- E. FS SS-T-312 - Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl Composition.
- F. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.

#### 1.3 SUBMITTALS

- A. Provide product data on specified products, describing physical and performance characteristics, sizes, patterns and colors available.
- B. Submit standard samples illustrating color and pattern for each floor material specified.
- C. Submit standard samples of base material for each color available.
- D. Submit manufacturer's installation instructions under provisions of Section 01300.

#### 1.4 OPERATION AND MAINTENANCE DATA

- A. Submit cleaning and maintenance data under provisions of Section 01700.
- B. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

#### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

- B. Maintain ambient temperature required by adhesive manufacturer three days prior to, during, and 24 hours after installation of materials.

#### 1.6 EXTRA MATERIALS

- A. Provide 12 sq ft of flooring and 10 lineal feet of base and stair material of each material specified under provisions of Section 016000

### 2. PART 2 PRODUCTS

#### 2.1 MANUFACTURERS - TILE FLOORING

- A. See Drawings. Proprietary product.

#### 2.2 TILE FLOORING MATERIALS

- A. Vinyl Composition Tile: FS SS-T-312, Type IV, Composition 1; 12 x 12 inch size, 1/8 inch thick; marbelized design.

#### 2.3 BASE MATERIALS

- A. Base: FS SS-W-40, Type 2 vinyl; 4 inch high; 1/8 inch thick; top set coved; premolded external corners.
- B. Base Accessories: Premolded end stops and external corners, of same material, size, and color as base.

#### 2.4 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.
- C. Sealer and Wax: Types recommended by flooring manufacturer.

### 3. PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft and are ready to receive Work.
- B. Verify concrete floors are dry to a maximum moisture content of 7 percent, and exhibit negative alkalinity, carbonization, or dusting.
- C. Beginning of installation means acceptance of existing substrate and site conditions.



### 3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
- B. Apply, trowel, and float filler to leave a smooth, flat, hard surface.
- C. Prohibit traffic from area until filler is cured.
- D. Vacuum clean substrate.

### 3.3 INSTALLATION - TILE MATERIAL

- A. Install in accordance with manufacturers' instructions.
- B. Mix tile from container to ensure shade variations are consistent.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Set flooring in place; press with heavy roller to attain full adhesion.
- E. Lay flooring with joints parallel to building lines to produce symmetrical tile patterns.
- F. Install tile to square grid pattern with all joints aligned. Allow minimum 1/2 full size tile width at room or area perimeter.
- G. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.
- H. Install edge strips at unprotected or exposed edges, and where flooring terminates.
- I. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

### 3.4 INSTALLATION - BASE MATERIAL

- A. Fit joints tight and vertical. Maintain minimum measurement of 72 inches between joints. Install longest continuous lengths possible.
- B. Miter internal corners. At external corners, use pre-molded units. At exposed ends use pre-molded units.
- C. Install base on solid backing. Bond tight to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

### 3.5 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.

### 3.6 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean, seal, and wax floor and base surfaces in accordance with manufacturer's instructions.

**END OF SECTION 09 65 00**

END OF SECTION

## SECTION 09 91 00 - PAINTING

### 1. PART 1 GENERAL

#### 1.1 WORK INCLUDED

- A. Surface preparation.
- B. Surface finish schedule.

#### 1.2 RELATED WORK

- A. Section 051600 - Metal Fabrications: Epoxy Primer.

#### 1.3 REFERENCES

- A. ANSI/ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. ASTM D2016 - Test Method for Moisture Content of Wood.

#### 1.4 DEFINITIONS

- A. Conform to ANSI/ASTM D16 for interpretation of terms used in this Section.

#### 1.5 SUBMITTALS

- A. Submit samples under provisions of Section 013300.
- B. Submit two samples illustrating range of colors and textures available for each surface finishing product scheduled, for selection.
- C. Submit manufacturer's application instructions under provisions of Section 013300.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site under provisions of Section 016000.
- B. Store and protect products under provisions of Section 016000.
- C. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.
- D. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.

- E. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in well ventilated area, unless required otherwise by manufacturer's instructions.
- F. Take precautionary measures to prevent fire hazards and spontaneous combustion.

#### 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.
- C. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for Varnish and Finishes: 65 degrees F (18 degrees C) for interior or exterior, unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

#### 1.8 EXTRA STOCK

- A. Provide a one-gallon container of each color to Owner.
- B. Label each container with color, texture, room locations, and in addition to the manufacturer's label.

### 2. PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS - PAINT

- A. Benjamin Moore.
- B. Valspar.
- C. Sherwin Williams.
- D. Or approved other.

#### 2.2 ACCEPTABLE MANUFACTURERS - PRIMER-SEALERS

- A. Benjamin Moore.
- B. Valspar.
- C. Sherwin Williams.
- D. Or approved other.

#### 2.3 MATERIALS

- A. Coatings: Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.

- B. Coatings: Good flow and brushing properties; capable of drying or curing free of streaks or sags.
- C. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

## 2.4 FINISHES

- A. Refer to schedule at end of Section for surface finish and color schedule.

## 3. PART 3 EXECUTION

### 3.1 INSPECTION

- A. Verify that surfaces substrate conditions are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Beginning of installation means acceptance of existing surfaces.

### 3.2 PREPARATION

- A. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing.
- B. Correct minor defects and clean surfaces which affect work of this Section.
- C. Shellac and seal marks which may bleed through surface finishes.
- D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- E. Aluminum Surfaces Scheduled for Paint Finish: Remove surface contamination by steam or high-pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
- F. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.
- G. Gypsum Board Surfaces: Latex fill minor defects. Spot prime defects after repair.
- H. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- I. Uncoated Steel and Iron Surfaces: Remove grease, scale, dirt, and rust. Where heavy

coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

- J. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Prime metal items including shop primed items.
- K. Interior Wood Items Scheduled to Receive Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.
- L. Exterior Wood Scheduled to Receive Paint Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied.
- M. Wood and Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

### 3.3 PROTECTION

- A. Protect elements surrounding the work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by work of this Section.
- C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

### 3.4 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.
- C. Apply each coat to uniform finish.
- D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- E. Sand lightly between coats to achieve required finish.
- F. Allow applied coat to dry before next coat is applied.
- G. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- H. Prime back surfaces of interior and exterior woodwork with primer paint.

- I. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.

### 3.5 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Remove unfinished ceiling louvers and grilles, on mechanical and electrical components and paint separately to match ceiling grid.
- B. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
- C. Replace electrical plates, hardware, light fixture trim, and fittings removed prior to finishing.

### 3.6 CLEANING

- A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.
- B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.
- C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

### 3.7 SCHEDULE - SHOP PRIMED ITEMS FOR SITE FINISHING

- A. Metal Fabrications (Section 051600): Exposed steel

### 3.8 SCHEDULE - EXTERIOR SURFACES

- A. Steel bollards, steel framing, and steel columns.
  - 1. Two coats alkyd enamel, semi-gloss.
- B. CMU - Painted
  - 1. One coat block filler.
  - 2. Two coats epoxy.
- C. Steel - Shop Primed (doors and frames)
- D. Touch-up with zinc rich primer.
- E. Two coats alkyd enamel, semi-gloss.

### 3.9 SCHEDULE - INTERIOR SURFACES

- A. Miscellaneous Steel (doors and frames)
  - 1. Touch-up with original primer.
  - 2. Two coats alkyd enamel, semi-gloss.

B. Concrete Floors (Sealers)

1. Two coats clear sealer.

C. Drywall

1. One coat primer.
2. Two Coats Latex, eggshell (bulkheads), flat (ceiling) satin (walls).

**END OF SECTION 09 91 00**



## SECTION 102800 - TOILET, BATH AND LAUNDRY ACCESSORIES

### 1. PART 1 GENERAL

#### 1..1 SECTION INCLUDES

- A. Toilet and washroom accessories, see drawings.
- B. Attachment hardware.

#### 1..2 RELATED SECTIONS

- A. Section 061053 - Miscellaneous Rough Carpentry.

#### 1..3 REFERENCES

- A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible To and Usable by Physically Handicapped People.
- B. ANSI/ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strips.
- C. ANSI/ASTM A366 - Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
- D. ANSI/ASTM A386 - Zinc Coating (Hot-Dip) on Assembled Steel Products.
- E. ANSI/ASTM B456 - Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- F. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- G. ASTM A269 - Seamless and Welded Austenitic Stainless-Steel Tubing for General Service.
- H. NEMA LD-3 - High Pressure Decorative Laminates.

#### 1..4 SUBMITTALS

- A. Submit product data under provisions of Section 013300.
- B. Provide product data on accessories describing size, finish, details of function, attachment methods.
- C. Submit manufacturer's installation instructions under provisions of Section 01300.

#### 1..5 REGULATORY REQUIREMENTS

- A. Conform to code for installing work in conformance with ANSI A117.1.

#### 1.6 SEQUENCING AND SCHEDULING

- A. Coordinate the work of this Section with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

### 2. PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Bobrick
- B. Mockett
- C. Or approved equal

#### 2.2 MATERIALS

- A. Fasteners, Screws, and Bolts: Hot dip galvanized and tamperproof.
- B. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

#### 2.3 FABRICATION

- A. Weld and grind smooth joints of fabricated components.
- B. Form exposed surfaces from single sheet of stock, free of joints.
- C. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- D. Back paint components where contact is made with building finishes to prevent electrolysis.
- E. Shop assemble components and package complete with anchors and fittings.
- F. Provide steel anchor plates, adapters, and anchor components for installation.
- G. Hot dip galvanize exposed and painted ferrous metal and fastening devices.

#### 2.4 FACTORY FINISHING

- A. Stainless Steel: No. 4 satin luster finish.

### 2. PART 3 EXECUTION

#### 2.1 EXAMINATION

- A. Verify that site conditions are ready to receive work and dimensions are as indicated on shop drawings.

- B. Beginning of installation means acceptance of existing conditions.

## 2..2 PREPARATION

- A. Deliver inserts and rough-in frames to site at appropriate time for building-in.
- B. Provide templates and rough-in measurements as required.
- C. Verify exact location of accessories for installation.

## 2..3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.

## 2..4 GRAB BARS

- A. Shapes as indicated on Drawings. 1 1/4-inch diameter non-slip surface.
  - 1. Manufacturer: Bobrick Washroom Equipment, Inc.
  - 2. Install in each handicap toilet.

## 3.5 SCHEDULE

- A. See Drawing.

**END OF SECTION 10 28 00**

## SECTION 104416 - FIRE EXTINGUISHERS

### 1. PART 1 GENERAL

#### 1..1 WORK INCLUDED

- A. Fire extinguishers.
- B. Cabinets.
- C. Accessories.

#### 1..2 RELATED WORK

- A. Section 061053 - Wood Blocking: Roughed-in wall openings.

#### 1..3 REFERENCES

- A. NFPA 10 - Portable Fire Extinguishers.

#### 1..4 QUALITY ASSURANCE

- A. Conform to NFPA 10 requirements for extinguishers and fire blankets.

#### 1..5 SUBMITTALS

- A. Submit product data under provisions of Section 013300.
- B. Include physical dimensions, operational features, color and finish, wall mounting brackets with mounted measurements, anchorage details, rough-in measurements, location, and details.
- C. Submit manufacturer's installation instructions under provisions of Section 013300.

#### 1..6 OPERATION AND MAINTENANCE DATA

- A. Submit manufacturer's operation and maintenance data under provisions of Section 016000.
- B. Include test, refill or recharge schedules, procedures, and re-certification requirements including requirements applicable to the Work.

#### 1..7 ENVIRONMENTAL REQUIREMENTS

- A. Do not install extinguishers when ambient temperatures may cause freezing.

## 2. PART 2 PRODUCTS

### 2..1 EXTINGUISHERS

- A. Dry Chemical Type: Steel tank, Model Cosmic 10E and Cosmic 5E manufactured by J. L. Industries or equal; with pressure gage, 4A-60BC and 2A-10BC.

### 2..2 CABINETS

- A. Cabinet: Alum, semi-recessed type, size to accommodate accessories. Clear VU Series with clear bubble manufactured by J. L. Industries or approved equal.

### 2..3 Mounting Hardware: Appropriate to cabinet.

### 2..4 FABRICATION

- A. Form body of cabinet with tight inside corners and seams.
- B. Pre-drill holes for anchorage.
- C. Form perimeter trim and door stiles by welding, filling, and grinding smooth.
- D. Hinge doors for 180 degree opening with two butt continuous piano hinge. Provide nylon roller type catch.
- E. Glaze doors with resilient channel gasket glazing.

### 2..5 FINISHES

- A. Extinguisher: Red enamel.
- B. Cabinet Trim and Door: Anodized to clear color.
- C. Cabinet Interior: white enamel.

### 2..6 QUANTITY

- A. Provide a minimum of one at each exit per floor in new addition areas and existing building. Coordinate location with drawings, Engineer, Fire Department.

## 3. PART 3 EXECUTION

### 3..1 INSPECTION

- A. Verify rough openings for cabinet are correctly sized and located.
- B. Beginning of installation means acceptance of existing conditions.

### 3..2 INSTALLATION

- A. Install cabinets plumb and level in wall openings
- B. Secure rigidly in place in accordance with manufacturer's instructions.

### 3..3 SCHEDULE

- A. Provide two extinguishers and cabinets per floor. Location to be determined in field by Engineer.

**END OF SECTION 10 44 16**

## **SECTION 230000 – GENERAL PROVISIONS MECHANICAL**

### **PART 1: GENERAL**

SECTION INCLUDES – The following scope of work:

A. Heating & ventilation for new and renovated spaces as depicted in the Contract Documents.

### **PART 2: SUMMARY OF WORK**

A. Provide new heating equipment to supply new garage space.

a. Provide a ceiling-mounted dragon Breath Heater or approved equal, supplied by existing boiler.  
Add new zone for garage space.

B. Provide new bathroom ventilation to new Decon Room and new ADA Bathroom.

C. Decommission and remove existing fuel storage tank.

D. Provide new 275 gallon fuel storage tank in proposed location.

### **PART 3: CODES AND STANDARDS**

All work shall be performed in accordance with the applicable requirements of Federal, State and Local Agencies. Where a conflict in code requirements is encountered, the most stringent requirement shall apply. The following list of codes and agencies is meant to be used as a guide:

- 2015 International Building Code
- 2015 International Energy Conservation Code
- 2015 International Mechanical Code
- 2015 International Fuel & Gas Code
- 2015 International Fire Code
- 2016 Supplement to the NYS Energy Conservation Construction Code
- 2017 Uniform Code Supplement (New York State)
- National Electrical Code (NEC), 1996 Edition
- National Fire Protection Association
- Underwriters Laboratories
- Occupational Safety and Health Agency (OSHA)
- Americans with Disabilities Act (ADA)

### **PART 4: PERMITS**

The contractor shall obtain and pay for all permits required for work of this contract.

### **PART 5: GUARANTEES**

Written guarantee: the contractor shall submit a written guarantee to include all systems, materials, and workmanship for a period of one year from date of final acceptance by Owner. The guarantee period will begin on the date the contractor receives written notice of acceptance by the owner and/or engineer.

### **PART 6: WORK & MATERIALS**

Provide all labor, materials and equipment as usually provided, and as required for the delivery, the erection, the proper working, and the complete finish of the work of this Contract.

#### **PART 7: SPECIFICATIONS**

The intent of the specifications is that the contractor shall design and furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the work of this project, in accordance with the contract documents and all incidental work necessary to complete the project in an acceptable manner, ready for use, occupancy or operation by the owner.

#### **PART 8: RECORD DRAWINGS**

On completion of the job, the contractor shall furnish to the owner his original tracings or reproducible transparencies of all shop drawings. The contractor shall note changes from the design drawings on the as-built drawings. Where shop drawings are not available, the contractor shall produce as-built drawings. As-built drawings shall be submitted to the architect for approval. After approval, they shall become the property of the owner.

#### **PART 9: CUTTING, PATCHING & PAINTING**

All cutting and patching required to perform work of this contract shall be provided by the contractor. All surfaces and finishes in areas disturbed by work of this contract, either intentionally or accidentally, shall be restored to a condition equal or better than found. Prepare surface and remove surface finishes to provide for proper installation of finishes.

#### **PART 10: CLEAN UP**

The contractor shall be responsible for cleaning up the debris, rubbish, etc., generated by the contractors' own operation. The contractor shall clean up the project site periodically and as directed by the Engineer.

#### **PART 11: INSERTS & SUPPORTS**

It shall be the responsibility of the installer of a particular piece of equipment to provide the proper means of anchoring and support. All supports shall be installed to properly transfer the loads to the surrounding structure.

#### **PART 12: FIRESTOPPING**

Provide fire stopping in all spaces around penetrations and other openings in fire rated partitions, floors, walls and ceilings. Where pipe, conduit or equipment penetrates a floor, ceiling, or wall in a fire rated space, close off space between conduit or equipment and adjacent work with fire stopping insulation and caulk. Provide close fitting metal collar or escutcheon covers at both sides of exposed penetrations.



**END SECTION 23 00 00**

## SECTION 260000 – GENERAL PROVISIONS ELECTRIC

### PART 1: GENERAL

SECTION INCLUDES – The following scope of work;

#### 1.1 SCOPE OF WORK:

- A. General electrical responsibilities of providing and installing of, but not limited to the following for a complete occupiable building for the specified use:
  - 1. General wirings.
  - 2. Switches and outlets.
  - 3. Main & sub-panels as required.
  - 4. Electrical fixtures.
  - 5. Fire alarm.

#### 1.2 RELATED SECTIONS:

- A. Section 283100 Fire Detection and Alarm.

#### 1.3 WORK INCLUDED:

- A. Provide all materials and equipment necessary for the proper installation and operation of the systems, even though not mentioned in the contract documents, but which are reasonably implied or usually incorporated to make up a complete system.
- B. Contract drawings and specifications are complementary and must be so used to ascertain all requirements of the work
- C. Contractor is responsible for all Bidding Requirements, General Conditions, and General Requirements. All costs of materials, labor, taxes, permit fees and inspections are to be included in bid proposal.
- D. Contractor is responsible to review and understand all drawings and all work of all trades to ensure a complete and thorough project. The Contractor shall become familiar with all drawings relating to this project in order to layout the work so as not to interfere with the work of other trades.
- E. Coordinate installation, size, and locations prior to system installation.
- F. All work shall be executed in accordance with recognized standards of workmanship. All work shall be installed in a neat and orderly manner. If, in the judgment of the Architect/Owner, the workmanship is not acceptable, the work in question is to be removed and reinstalled in a manner satisfactory to the Owner and Architect/Engineer.
- G. All power and control wiring are to be by the electrical contractor, the mechanical, plumbing and sprinkler contractors shall supply and install all components, schematics and information for their trades. This contractor shall provide and install all wiring and disconnects.
- H. The following codes and standards shall be adhered to. Unless stated otherwise in the contract documents, the latest edition of these codes and standards shall be used except when a document is amended or issued during the course of a project, in which case the edition in affect at the time of bidding shall be used. Where the requirements of these specifications or drawings exceed code and standard minimums, the specifications and drawings shall govern.
  - 1. National Fire Protection Association (NFPA)
  - 2. 2015 International Building Code

3. 2017 Uniform Code Supplement (New York State)
  4. 2015 International Fire Code
  5. National Electrical Code (Latest edition)
  6. Underwriter's Laboratories Standards (UL)
  7. National Electrical Manufacturers Association (NEMA)
  8. Occupational Safety and Health Act (OSHA)
- I. Maintain fire integrity of structures penetrated by this contractor using approved fire-sealing methods.
  - J. This contractor is responsible for all excavation and backfill related to his work.
  - K. The Contractor shall provide supports and hangers for proper support of apparatus, materials and equipment from ceiling and/or wall construction using all necessary plates, bridging, inserts and expansion shields as required.
  - L. Contractor to provide a 1-year guarantee and manufacturer's warranty for all materials from owner acceptance date.

## **PART 2: PERMITS AND INSPECTIONS**

- A. Permits: The Contractor shall apply for and pay the cost for any local permits necessary for the work of this contract.
- B. The undertaking of periodic inspections by the Owner or Architect shall not be construed as supervision of actual construction. The Owner or Architect is not responsible for providing a safe place of work for the Contractor, Contractor's employees, suppliers or subcontractors for access, visits, use, work, travel or occupancy by any person.

## **PART 3: EXECUTION**

### **3.1 GENERAL**

- A. Installation of new conductors, including branch circuits, junction boxes, rough boxes and supporting devices.
- B. Miscellaneous electrical items.
- C. Supply and installation of all required materials for new service, including coordination with the local utility company.
- D. Patch all holes left by relocation of equipment with appropriate application.

**END OF SECTION 26 00 00**

## SECTION 28 31 00 - FIRE DETECTION AND ALARM

### PART 1 – GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Commercial Smoke/Fire Detection and Alarm Systems components, UL Listed.
  - 2. Devices:
    - a. Built in Synch/Strobe/Horn module on each NAC for Notification appliances

#### 1.2 REFERENCES

- A. National Fire Protection Association (NFPA):
  - 1. NFPA 70; National Electrical Code - The standard for the safe installation of electrical wiring and equipment in the United States.
  - 2. NFPA 72; National Fire Alarm and Signaling Code.
  - 3. NFPA 90A; Standard for the installation of Air Conditioning and Ventilating systems.
- B. Underwriters Laboratories, Inc. (UL):
  - 1. UL 864; Standard of safety for access control system units

#### 1.3 SUBMITTALS

- B. Product Data: Product Data sheets with the printed logo or trademark of only one manufacturer of all the equipment. Indicated in the documentation shall be the type, size, rating, style, and catalog number for all items proposed to meet the system performance detailed in this specification. The proposed equipment shall be subject to the approval of the Owner's representative and (AHJ).
- C. Wiring diagrams shall indicate internal wiring for each device and the interconnections between the items of equipment with all wire runs, conductors & length of wire.
- D. Provide a clear and concise description of operation that gives in detail, the information required to properly operate the equipment and system.

#### 1.4 DELIVERY, STORAGE & HANDLING

- A. Determine and coordinate the openings for delivery and installation of equipment.
- B. Storage and Protection:
  - 1. Hardware received, but not installed shall be placed in secured storage. Control handling to prevent losses and delays before and after installation.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. List of approved manufacturers:
  - 1. Napco Intrusion and Fire
  - 2. Cooper Industries
  - 3. Or Approved Other

## 2.2 ASSEMBLY

### 1. Notification Appliances:

1. Audible/Visual Device: Provide low profile wall mount horn/strobes at the locations shown on the drawings. The horn/strobe shall provide an audible output of approx. 95 dBA at 10 feet when measured in reverberation room per UL-464. Strobes shall provide synchronized flash outputs as described above. Separate screw terminals shall be provided for wiring for each device. Low profile horn/strobes shall mount to one-gang electrical box.

## **PART 3 - EXECUTION**

### 3.1 INSTALLATION

- A. Comply with NFPA 72 and NEC requirements for all installed devices. Identify system components, wiring, cabling and terminals. Comply with requirements for identification specified in Division 16 Section Electrical. Install framed instructions in a location visible from fire-alarm control unit acceptable to the (AHJ)
- B. Equipment Mounting: Install fire-alarm control unit at 72 inches Above Finished Floor (AFF) with tops of cabinets not more than 72 inches above the finished floor.
- C. New components shall be capable of merging with existing system configuration without degrading the performance of either system. Existing system must be made compatible with any new devices by interface.
- F. Install Notification Appliance Devices between 80 and 96 inches on the wall (AFF). Verify that each strobe unit complies with candela requirements for the application.

### 3.2 FIELD QUALITY CONTROL

- A. Identification:
  1. Provide label identification for each device not commonly identified or as requested by the (AHJ). This includes 120vac power source with panel label and exact location inside the fire alarm and NAC panels.
- B. Grounding:
  1. Verify that all panels are properly grounded for compliance with NEC & local code.

### 3.3 CLOSEOUT ACTIVITIES

- A. Refer to Division 01 "Closeout Procedure's" section or sections for activities related to the close out procedures including operations manuals, maintenance, demonstration, and training requirements.
- B. Demonstration & Testing:
  1. Field tests shall be witnessed by Architect, Engineer and (AHJ). Prior to performing the final test, require a certified service representative to inspect, test, and adjust all components, assemblies, and equipment installations, including all connections to verify the system integrity.
  2. Perform Final Tests for the (AHJ). Utilize a certified service representative factory trained on this equipment to perform all testing for the authorities. Verify each and every device is tested on full AC power and on DC backup power for authorities. Conduct a complete visual inspection of all devices and controls.

**END OF SECTION 28 31 00**

## SECTION 31 20 00 - EARTH MOVING

### 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. Preparing sub-grades for slabs-on-grade, walks, pavements, turf and grasses, and plants.
  - 2. Excavating and backfilling for buildings and structures.
  - 3. Drainage course for concrete slabs-on-grade.
  - 4. Sub-base course for concrete walks and pavements.
  - 5. Sub-base course and base course for asphalt paving.
- B. Related Sections:
  - 1. Division 03 Section "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
  - 2. Division 32 Section "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.

#### 1.3 UNIT PRICES

- A. Work of this Section is affected by unit prices for earth moving specified in Division 01 Section "Unit Prices."
- B. Quantity allowances for earth moving are included in Division 01 Section "Allowances."

#### 1.4 QUALITY ASSURANCE

- A. Pre-excavation Conference: Conduct conference at Project site.

#### 1.5 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
  - 1. Do not proceed with work on adjoining property until directed by Architect.
- C. Utility Locator Service: Notify utility locator service "Dig Safely NY" for area where Project is located before beginning earth moving operations.

### PART 2 - PRODUCTS

#### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487 or a combination of these groups; free of rock or gravel larger than 3 inches (75

mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487 or a combination of these groups.
  - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Sub-base Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- H. Drainage Course: Narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
- I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.
- J. Sand: ASTM C 33; fine aggregate.
- K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

## 2.2 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; colored as follows:
  - 1. Red: Electric.
  - 2. Yellow: Gas, oil, steam, and dangerous materials.
  - 3. Orange: Telephone and other communications.
  - 4. Blue: Water systems.
  - 5. Green: Sewer systems.
- B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
  - 1. Red: Electric.
  - 2. Yellow: Gas, oil, steam, and dangerous materials.
  - 3. Orange: Telephone and other communications.
  - 4. Blue: Water systems.
  - 5. Green: Sewer systems.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Prior to any excavation contact Dig Safely NY to locate underground utilities.
- B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- C. Protect sub-grades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

### 3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared sub-grades, and from flooding Project site and surrounding area.
- B. Protect sub-grades from softening, undermining, washout, and damage by rain or water accumulation.
  - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

### 3.3 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to sub-grade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
  - 2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
    - a. 24 inches (600 mm) outside of concrete forms other than at footings.
    - b. 12 inches (300 mm) outside of concrete forms at footings.
    - c. 6 inches (150 mm) outside of minimum required dimensions of concrete cast against grade.
    - d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
    - e. 6 inches (150 mm) beneath bottom of concrete slabs-on-grade.
    - f. 6 inches (150 mm) beneath pipe in trenches, and the greater of 24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.

### 3.4 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
  - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
  - 2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus



or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand to indicated lines, cross sections, elevations, and sub-grades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Division 01 Section "Temporary Tree and Plant Protection."

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and sub-grades.

3.6 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Architect.
1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect/Engineer.

3.7 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.8 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
1. Construction below finish grade including, where applicable, sub-drainage, dampproofing, waterproofing, and perimeter insulation.
  2. Surveying locations of underground utilities for Record Documents.
  3. Testing and inspecting underground utilities.
  4. Removing concrete formwork.
  5. Removing trash and debris.
  6. Removing temporary shoring and bracing, and sheeting.
  7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Backfill shall consist of non-expansive, free-draining, predominantly granular material, free of debris and organic material.
- C. All ground over which footings and slabs-on-grade are to be placed shall be free of expansive material or compressible debris and organic material.
- D. Footings and slabs-on-grade concrete shall not be placed on muddy or frozen ground.

3.9 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 6 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
  - 1. Under structures, building slabs, steps, and pavements, scarify and re-compact top 12 inches (300 mm) of existing sub-grade and each layer of backfill or fill soil material at 95 percent.
  - 2. Under walkways, scarify and re-compact top 6 inches (150 mm) below sub-grade and compact each layer of backfill or fill soil material at 92 percent.
  - 3. Under turf or unpaved areas, scarify and re-compact top 6 inches (150 mm) below sub-grade and compact each layer of backfill or fill soil material at 85 percent.
  - 4. For utility trenches, compact each layer of initial and final backfill soil material at 92 percent.

### 3.10 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
  - 1. Provide a smooth transition between adjacent existing grades and new grades.
  - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish sub-grades to required elevations within the following tolerances:
  - 1. Turf or Unpaved Areas: Plus or minus 1 inch (25 mm).
  - 2. Walks: Plus or minus 1 inch (25 mm).
  - 3. Pavements: Plus or minus 1/2 inch (13 mm).

### 3.11 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place sub-base course and base course on sub-grades free of mud, frost, snow, or ice.
- B. On prepared sub-grade, place sub-base course and base course under pavements and walks as follows:
  - 1. Install separation geotextile on prepared sub-grade according to manufacturer's written instructions, overlapping sides and ends.
  - 2. Place base course material over sub-base course under hot-mix asphalt pavement.
  - 3. Shape sub-base course and base course to required crown elevations and cross-slope grades.
  - 4. Place sub-base course and base course 6 inches (150 mm) or less in compacted thickness in a single layer.
  - 5. Place sub-base course and base course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
  - 6. Compact sub-base course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.
- C. Pavement Shoulders: Place shoulders along edges of sub-base course and base course to prevent lateral movement. Construct shoulders, at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each sub-base and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.12 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on sub-grades free of mud, frost, snow, or ice.
- B. On prepared sub-grade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
  - 1. Install sub-drainage geotextile on prepared sub-grade according to manufacturer's written instructions, overlapping sides and ends.
  - 2. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
  - 3. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
  - 4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.13 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
  - 1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and re-compact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.14 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
  - 1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

**END OF SECTION 31 20 00**

## SECTION 321216 - ASPHALT PAVING

### 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. Hot-mix asphalt paving.
  - 2. Pavement-marking paint.
- B. Related Sections:
  - 1. Division 31 Section "Earth Moving" for aggregate subbase and base courses and for aggregate pavement shoulders.

#### 1.3 DEFINITION

- A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
  - 1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
  - 2. Job-Mix Designs: For each job mix proposed for the Work.
- B. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.
- C. Samples: For each paving fabric, **12 by 12 inches** minimum.
- D. Qualification Data: For qualified manufacturer and Installer.
- E. Material Certificates: For each paving material, from manufacturer.
- F. Material Test Reports: For each paving material.

## 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located.
- B. Installer Qualifications: Imprinted-asphalt manufacturer's authorized installer who is trained and approved for installation of imprinted asphalt required for this Project.
- C. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.
- D. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of for asphalt paving work.
  - 1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.
- E. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:
    - a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
    - b. Review condition of subgrade and preparatory work.
    - c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
    - d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

## 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
  - 1. Prime Coat: Minimum surface temperature of 60 deg F.
  - 2. Tack Coat: Minimum surface temperature of 60 deg F.

3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
  4. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
  5. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, and not exceeding 95 deg F.

## PART 2 - PRODUCTS

### 2.1 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.
- C. Fine Aggregate: ASTM D 1073 or, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.
  1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.
- D. Mineral Filler: ASTM D 242, rock or slag dust, hydraulic cement, or other inert material.

### 2.2 ASPHALT MATERIALS

- A. Asphalt Binder: AASHTO M 320.
- B. Asphalt Cement: ASTM D 3381 for viscosity-graded material.
- C. Prime Coat: ASTM D 2027, medium-curing cutback asphalt.
- D. Prime Coat: Asphalt emulsion prime coat complying with local DOT requirements.
- E. Tack Coat: ASTM D 977.
- F. Fog Seal: ASTM D 977 emulsified asphalt.
- G. Water: Potable.
- H. Undersealing Asphalt: ASTM D 3141, pumping consistency.

## 2.3 AUXILIARY MATERIALS

- A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.
- B. Sand: ASTM D 1073, Grade Nos. 2 or 3.
- C. Paving Geotextile: AASHTO M 288, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.
- D. Joint Sealant: ASTM D 6690, hot-applied, single-component, polymer-modified bituminous sealant.
- E. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248; colors complying with FS TT-P-1952.
  - 1. Color: White.
- F. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 72 inches long. Provide chamfered corners, drainage slots on underside, and holes for anchoring to substrate.
  - 1. Dowels: Galvanized steel, 3/4-inch diameter, 10-inch minimum length.

## 2.4 MIXES

- A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types."
  - 1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
  - 2. Provide mixes complying with composition, grading, and tolerance requirements in ASTM D 3515 for the following nominal, maximum aggregate sizes:
    - a. Base Course: See Drawings.
    - b. Surface Course: See Drawings.
- B. Emulsified-Asphalt Slurry: ASTM D 3910.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.

- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
  - 1. Completely proof-roll subgrade in one direction. Limit vehicle speed to **3 mph**.
  - 2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than **15 tons**.
  - 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.
- D. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of imprinted asphalt.

### 3.2 REPAIRS

- A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than **1 inch** in existing pavements.
  - 1. Install leveling wedges in compacted lifts not exceeding **3 inches** thick.

### 3.3 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
  - 1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.
- C. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of **0.15 to 0.50 gal./sq. yd**. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure.
  - 1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
  - 2. Protect primed substrate from damage until ready to receive paving.
- D. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of **0.05 to 0.15 gal./sq. yd**.
  - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.



2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

### 3.4 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
  1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
  2. Place hot-mix asphalt surface course in single lift.
  3. Spread mix at minimum temperature of **250 deg F**.
  4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
  5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than **10 feet** wide unless infill edge strips of a lesser width are required.
  1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

### 3.5 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
  1. Clean contact surfaces and apply tack coat to joints.
  2. Offset longitudinal joints, in successive courses, a minimum of **6 inches**.
  3. Offset transverse joints, in successive courses, a minimum of **24 inches**.
  4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane."
  5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
  6. Compact asphalt at joints to a density within 2 percent of specified course density.

### 3.6 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
  - 1. Complete compaction before mix temperature cools to **185 deg F**.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
  - 1. Average Density: 96 percent of reference laboratory density according to ASTM D 6927, but not less than 94 percent nor greater than 100 percent.
  - 2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

### 3.7 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
  - 1. Base Course: Plus or minus **1/2 inch**.
  - 2. Surface Course: Plus **1/4 inch**, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a **10-foot** straightedge applied transversely or longitudinally to paved areas:

1. Base Course: **1/4 inch**.
2. Surface Course: **1/8 inch**.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is **1/4 inch**.

### 3.8 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.
- B. Allow paving to age for 30 days before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of **15 mils**.
  1. Broadcast glass beads uniformly into wet pavement markings at a rate of **6 lb/gal**.

### 3.9 WHEEL STOPS

- A. Install wheel stops in bed of adhesive as recommended by manufacturer.
- B. Securely attach wheel stops to pavement with not less than two galvanized-steel dowels embedded at one-quarter to one-third points. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop.

### 3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.
- C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.
  1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
  2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

- a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.
    - b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.
  - E. Replace and compact hot-mix asphalt where core tests were taken.
  - F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.
- 3.11 DISPOSAL
- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.
    - 1. Do not allow milled materials to accumulate on-site.

**END OF SECTION 321216**

## SECTION 321373 - CONCRETE PAVING JOINT SEALANTS

### 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. Cold-applied joint sealants.
- B. Related Sections:
  - 1. Division 32 Section "Asphalt Paving" for constructing joints between concrete and asphalt pavement.
  - 2. Division 32 Section "Concrete Paving" for constructing joints in concrete pavement.

#### 1.3 PRECONSTRUCTION TESTING

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, Samples of materials that will contact or affect joint sealants.
  - 1. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
  - 2. Submit no fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
  - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
  - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
  - 5. Testing will not be required if joint-sealant manufacturers submit joint-preparation data that are based on previous testing, not older than 24 months, of sealant products for compatibility with and adhesion to joint substrates and other materials matching those submitted.

#### 1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in **1/2-inch-** wide joints formed between two **6-inch-**long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- C. Pavement-Joint-Sealant Schedule: Include the following information:
  - 1. Joint-sealant application, joint location, and designation.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation.
  - 4. Joint-sealant color.
- D. Qualification Data: For qualified Installer.
- E. Product Certificates: For each type of joint sealant and accessory, from manufacturer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for joint sealants.

- G. Preconstruction Compatibility and Adhesion Test Reports: From joint-sealant manufacturer, indicating the following:
  - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility with and adhesion to joint sealants.
  - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain each type of joint sealant from single source from single manufacturer.
- C. Product Testing: Test joint sealants using a qualified testing agency.
  - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
- D. Pre-installation Conference: Conduct conference at Project site.

#### 1.6 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

#### 2.2 COLD-APPLIED JOINT SEALANTS

- A. Single-Component, Nonsag, Silicone Joint Sealant for Concrete: ASTM D 5893, Type NS.
  - 1. Products: Subject to compliance with requirements, provide the following:
    - a. Sikaflex.
    - b. Crafco Inc., an ERGON company; RoadSaver Silicone.
    - c. Dow Corning Corporation; 888.
    - d. Pecora Corporation; 301 NS.
- B. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: ASTM D 5893, Type SL.
  - 1. Products: Subject to compliance with requirements, provide the following:
    - a. Sikaflex.
    - b. Crafco Inc., an ERGON company; RoadSaver Silicone SL.
    - c. Dow Corning Corporation; 890-SL.

- d. Pecora Corporation; 300 SL.
- C. Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant for Concrete: ASTM C 920, Type M, Grade P, Class 25, for Use T.
  - 1. Products: Subject to compliance with requirements, provide the following:
    - a. Pecora Corporation; Urexpan NR-200.

### 2.3 HOT-APPLIED JOINT SEALANTS

- A. Hot-Applied, Single-Component Joint Sealant for Concrete: ASTM D 3406.
  - 1. Products: Subject to compliance with requirements, provide the following:
    - a. Sikaflex.
    - b. Crafcro Inc., an ERGON company; Superseal 444/777.
- B. Hot-Applied, Single-Component Joint Sealant for Concrete and Asphalt: ASTM D 6690, Types I, II, and III.

### 2.4 JOINT-SEALANT BACKER MATERIALS

- A. General: Provide joint-sealant backer materials that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.
- B. Round Backer Rods for Cold- and Hot-Applied Joint Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
- C. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.
- D. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

### 2.5 PRIMERS

- A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
- B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install joint-sealant backings of kind indicated to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of joint-sealant backings.
  - 2. Do not stretch, twist, puncture, or tear joint-sealant backings.
  - 3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install joint sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 1. Place joint sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:
  - 1. Remove excess joint sealant from surfaces adjacent to joints.
  - 2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

### 3.4 CLEANING

- A. Clean off excess joint sealant or sealant smears adjacent to joints as the Work progresses, by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### 3.5 PROTECTION

- A. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

### 3.6 PAVEMENT-JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Joints within cement concrete pavement.
  - 1. Joint Location:
    - a. Expansion and isolation joints in cast-in-place concrete pavement.
    - b. Contraction joints in cast-in-place concrete slabs.
    - c. Other joints as indicated.
  - 2. Silicone Joint Sealant for Concrete: Single component, nonsag.



3. Urethane Joint Sealant for Concrete: Multicomponent, pourable, traffic-grade.
  4. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- B. Joint-Sealant Application: Joints between cement concrete and asphalt pavement.
1. Joint Location:
    - a. Joints between concrete and asphalt pavement.
    - b. Joints between concrete curbs and asphalt pavement.
    - c. Other joints as indicated.
  2. Hot-Applied Joint Sealant for Concrete and Asphalt: Single component.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

**END OF SECTION 32 13 73**

## SECTION 32 92 00 – TURF & GRASSES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Seeding.
  - 2. All disturbed soil to be seeded and mulched.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
  - 1. Certification of each seed mixture. Include identification of source and name and telephone number of supplier.

#### 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

#### 1.4 PROJECT CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion.
  - 1. Fall Planting.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

#### 1.5 MAINTENANCE SERVICE

- A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:
  - 1. Seeded Turf: 60 days from date of planting completion.
    - a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.
- B. Initial Meadow Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable meadow is established, but for not less than 60 days from date of planting completion.

## **PART 2 - PRODUCTS**

### **2.1 SEED**

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species: State-certified seed of grass species as follows:
- C. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:
  - 1. Full Sun: Kentucky bluegrass (*Poa pratensis*), a minimum of three cultivars.
  - 2. Sun and Partial Shade: Proportioned by weight as follows:
    - a. 65 percent Kentucky bluegrass blend.
    - b. 20 percent perennial ryegrass.
    - c. 15 percent fine fescue.

### **2.2 PLANTING SOILS**

- A. Planting Soil: Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process and stockpiled on-site. Verify suitability of native surface topsoil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
  - 1. Supplement with planting soil when quantities are insufficient.
  - 2. Mix existing, native surface topsoil with the soil amendments and fertilizers to produce planting soil as required by planting supplier.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
  - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
  - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
  - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
  - 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

### **3.2 PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
  - 1. Protect grade stakes set by others until directed to remove them.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.
- C. Remove non-degradable erosion-control measures after grass establishment period.

**END OF SECTION 32 92 00**

## SECTION 33 41 13 – SUB-DRAINAGE

### 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. Perforated-wall pipe and fittings.
  2. Geotextile filter fabrics.

#### 1.3 SUBMITTALS

- A. Product Data:
  1. Drainage conduits, including rated capacities.
  2. Geotextile filter fabrics.

### PART 2 - PRODUCTS

#### 2.1 PERFORATED-WALL PIPES AND FITTINGS

- A. Perforated PVC Sewer Pipe and Fittings: ASTM D 2729, bell-and-spigot ends, for loose joints.

#### 2.2 DRAINAGE CONDUITS

- A. Single-Pipe Drainage Conduits: Prefabricated geo-composite with perforated corrugated core molded from HDPE complying with ASTM D 3350 and wrapped in geotextile filter fabric.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    - a. Advanced Drainage Systems, Inc.
  3. Filter Fabric: PP geotextile.
  4. Fittings: HDPE with combination NPS 4 and NPS 6 (DN 100 and DN 150) outlet connection.
  5. Couplings: Corrugated HDPE band.

#### 2.3 SOIL MATERIALS

- A. Soil materials are specified in Division 31 Section "Earth Moving."

#### 2.4 GEOTEXTILE FILTER FABRICS

- A. Description: Fabric of PP or polyester fibers or combination of both, with flow rate range from 110 to 330 gpm/sq. ft. (4480 to 13 440 L/min. per sq. m) when tested according to ASTM D 4491.
- B. Structure Type: Nonwoven, needle-punched continuous filament.
  1. Survivability: AASHTO M 288 Class 2.
  2. Styles: Flat and sock.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine surfaces and areas for suitable conditions where sub-drainage systems are to be installed.
- B. If sub-drainage is required for landscaping, locate and mark existing utilities, underground structures, and aboveground obstructions before beginning installation and avoid disruption and damage of services.
- C. Verify that drainage panels installed as part of foundation wall waterproofing is properly positioned to drain into sub-drainage system.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 EARTHWORK**

- A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

### **3.3 FOUNDATION DRAINAGE INSTALLATION**

- A. Lay flat-style geotextile filter fabric in trench and overlap trench sides.
- B. Place supporting layer of drainage course over compacted sub-grade and geotextile filter fabric, to compacted depth of not less than 4 inches (100 mm).
- C. Encase pipe with sock-style geotextile filter fabric before installing pipe. Connect sock sections with adhesive.
- D. Install drainage piping as indicated in Part 3 "Piping Installation" Article for foundation sub-drainage.
- E. Add drainage course to width of at least 6 inches (150 mm) on side away from wall and to top of pipe to perform tests.
- F. After satisfactory testing, cover drainage piping to width of at least 6 inches (150 mm) on side away from footing and above top of pipe to within 12 inches (300 mm) of finish grade.
- G. Install drainage course and wrap top of drainage course with flat-style geotextile filter fabric.
- H. Place layer of flat-style geotextile filter fabric over top of drainage course, overlapping edges at least 4 inches (100 mm).
- I. Install drainage panels on foundation walls as follows:
  - 1. Coordinate placement with other drainage materials.
  - 2. Lay perforated drainage pipe at base of footing. Install as indicated in Part 3 "Piping Installation" Article.
  - 3. Separate 4 inches (100 mm) of fabric at beginning of roll and cut away 4 inches (100 mm) of core. Wrap fabric around end of remaining core.
  - 4. Attach panels to wall beginning at sub-drainage pipe. Place and secure molded-sheet drainage panels, with geotextile facing away from wall.
- J. Place backfill material over compacted drainage course. Place material in loose-depth layers not exceeding 6 inches (150 mm). Thoroughly compact each layer. Final backfill to finish elevations and slope away from building.

### **3.4 PIPING INSTALLATION**

- A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.

1. Foundation Sub-drainage: Install piping level and with a minimum cover of 36 inches (915 mm) unless otherwise indicated.
  2. Retaining-Wall Sub-drainage: When water discharges at end of wall into stormwater piping system, install piping level and with a minimum cover of 36 inches (915 mm) unless otherwise indicated.
  3. Landscaping Sub-drainage: Install piping pitched down in direction of flow, at a minimum slope of 0.5 percent and with a minimum cover of 36 inches (915 mm) unless otherwise indicated.
  4. Lay perforated pipe with perforations down.
  5. Excavate recesses in trench bottom for bell ends of pipe. Lay pipe with bells facing upslope and with spigot end entered fully into adjacent bell.
- B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.
- C. Install thermoplastic piping according to ASTM D 2321.
- 3.5 PIPE JOINT CONSTRUCTION
- A. Join perforated PVC sewer pipe and fittings according to ASTM D 3212 with loose bell-and-spigot, push-on joints.
- 3.6 CLEANOUT INSTALLATION
- A. Comply with requirements for cleanouts specified in Division 33 Section "Storm Utility Drainage Piping."
- B. Cleanouts for Landscaping Sub-drainage:
1. Install cleanouts from piping to grade. Locate cleanouts at beginning of piping run and at changes in direction. Install fittings so cleanouts open in direction of flow in piping.
  2. In vehicular-traffic areas, use NPS 4 (DN 100) cast-iron soil pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, 18 by 18 by 24 inches deep. Set top of cleanout flush with grade.
  3. In nonvehicular-traffic areas, use NPS 4 (DN 100) PVC pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, 12 by 12 by 12 inches deep. Set top of cleanout 2 inches (50 mm) above grade.
  4. Comply with requirements for concrete specified in "Cast-in-Place Concrete."
- 3.7 CONNECTIONS
- A. Comply with requirements for piping specified in Division 33 Section "Storm Utility Drainage Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Where required, connect low elevations of under slab sub-drainage to stormwater sump pumps. Comply with requirements for sump pumps specified in Division 22 Section "Sump Pumps."
- 3.8 IDENTIFICATION
- A. Arrange for installation of green warning tapes directly over piping. Comply with requirements for underground warning tapes specified in Division 31 Section "Earth Moving."
1. Install PE warning tape or detectable warning tape over ferrous piping.
  2. Install detectable warning tape over nonferrous piping and over edges of underground structures.

3.9 CLEANING

- A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

**END OF SECTION 33 46 00**